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How One Progressive Foundry Increased Outgoing Tonnage

COOPERATION between employers and men has won many a hard battle for business. It is one of the good things which have come to us in these post-war days—born of the good feeling engendered by having plenty to go around. But it is even more essential when there is not plenty. And this article tells of such a case, and how well it has worked out for all concerned

INCREASED production per unit of equipment, with its associated advantages to workmen and management alike, is always a problem of interest in its application to modern jobbing foundries. Usually these developments have been noted when times are booming and when plants are operating at maximum capacity. This is because they have been necessitated by the urgent demand for more output than the ordinary capacities of the plants permitted.

Of especial interest now is the story of how the Standard Foundry Co., Worcester, Mass., succeeded by an intelligent application of these methods in keeping the plant operating at the highest rate in its history during a period when the tonnage trend of other foundries was decidedly downward.

There is no denying the fact that, when the general slump in business struck the country and the world at large last fall, its effects were felt by the Standard Foundry Co., along with the rest. But, fortunately, the management of this foundry had the vision to see what the far-reaching effects of the threatened crisis might mean—not only in its showing on the profit-and-loss ledger of the company but also upon the many employees whose means for livelihood would be discontinued.

This was a time which required business nerve and prompt action. On the other hand, it certainly would prove to be a mighty fine break for the workmen if, by modern methods, they could find ways and means, not only of holding their jobs but of actually increasing their earning capacity at a time when work was at a premium.

Analysis Showed High Cost for High Quality

Following a conference with the George S. May Co., New York, an analysis was made to ascertain in what ways quality could be improved and costs reduced. The analysis showed that the quality of the product being produced was of the highest grade, but that much of the work ordinarily done by skilled molders and coremakers did not require men of this degree of skill. It was felt that some of this work should be done by others. This plan would save considerable of the time of the skilled workers for the more difficult molding and coremaking operations. And, thus relieved, they would be able to work more efficiently.

It further showed that the high quality of product was attained at a very high cost to the company. The results of the analysis clearly indicated that, by the

applications of methods recommended, the capacity of the foundry could be increased about 50 per cent with its present buildings and equipment.

In a jobbing foundry, it is practical to undertake to supply only the number of customers which can be taken care of in times of ordinary business conditions. It is considered bad business to take on more customers, when times are slack, than can be properly serviced in normal times. But, with the increased capacity now assured, it became evident that the number of customers could be increased.

If the sales department could secure the additional customers, the workmen would be kept busy and contented during the slack period. The new customers added, however, were not secured on a price-cutting basis but, on the contrary, on the basis of higher quality of product, which would result from the new methods.

Taking the Men into Partnership

Formerly, the customer and the company were the only sufferers from bad castings produced—the former from delays in delivery of the requisite number of good castings, the latter by excessive cost. But by the new method the workman also suffers to the extent that he receives no remuneration for bad castings produced.

This plan, therefore, makes him equally responsible with the management in the production of high-quality work, while he also, on the other hand, shares equally in the economies effected. The plan, consequently, is a step in the right direction, since it brings about a healthy factory organization wherein the interests of the workmen and the management are mutual in the rapid production of work, with a minimum of spoilage.

The method of paying the workmen, as introduced, is essentially that of the bonus system, although it is known by the name of "ability system." This name was adopted because it implies that ability is recognized and justly rewarded. A standard time for each job is set, not by hit-and-miss methods, but by scientific methods, the time set being what an average workman would be expected to do if working under a straight day-work system. Then, if the workman succeeds in doing the job assigned in a shorter time, the saving in time is divided equally between the workman and the company.

To illustrate, suppose the time set for a job was 5 hr. and the workman's day-work wage $1 an hour. If he does the job in 4 hr., he makes a saving of one hour or of $1. Half of this dollar goes to the company, the other half to the workman. The result is that, in 4 hr., the workman earns $4.50 instead of $4 and the company pays the workman for doing the job $4.50 instead of $5. Certainly, this is a nice profit for both parties.

The analysis was made in February and the installation began immediately thereafter. At this writing, it is considered completed, and working satisfactorily to all parties concerned. It has made the company and the workers partners in the common job of making quality castings at fair costs.

Standards Set Are Fair All Around

The success attained is attributed, more than to any other factor, to the accuracy and fairness with which the standard times were determined, the time for each job having been arrived at by actual time studies. This left little room for arguments and misunderstandings, unfortunate conditions almost sure to arise when hit-and-miss or guess methods are used to determine this fundamental factor. With the time studies as a basis, charts were prepared to show the necessary time in which any job in molding, coremaking, or other work should be completed. The rates for all operations were set in minutes.

From the outset, the workmen were made to realize the justice of requiring the worker at fault in making any spoiled job to be obliged to replace it on his own time. The importance of this primacy of quality is due to the fact that this foundry does jobbing work exclusively, most of it being done for the great high-speed machine-tool builders of Central New England—that is, for concerns whose product is well known wherever machinery is used. The happy culmination to this endeavor is that the workers, bearing a strong and direct financial penalty for the production of bad castings, have become full partners in quality maintenance.

Not the least of the advantages resulting from the plan is the effort made by the workers to find ways and means to improve the quality of the castings. Now that their financial return is affected by the quality of the product, they are free with suggestions. And they will go willingly a long way to provide improved and better methods for doing many jobs which established custom had decreed should be done in certain routine methods. Intensive cooperation has become a reality.

The equally direct and immediate financial incentive has also made the employer interested in more production per dollar. The men now are earning a little over 10 per cent above their hourly rates, their production having been increased over 20 per cent to achieve this result. The largest amounts are being earned by the molders, in many cases production increases of as high as 40 per cent having been made. Each man, being on a time-rate basis, has become a business man whose interest in both quality and cost are concurrent with those of the company.

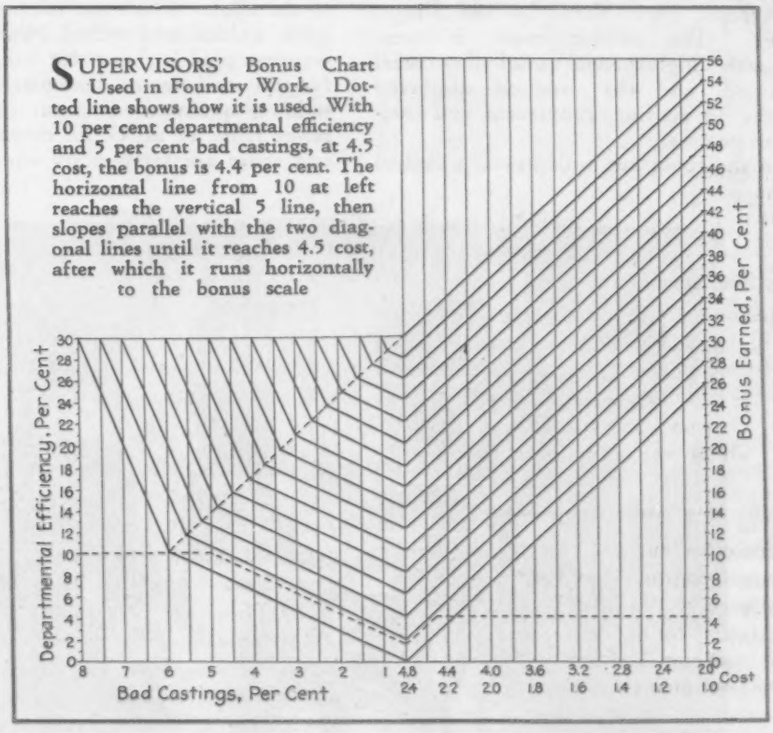
Auxiliary Departments Share in Profits

Even the service gang has become an interested business unit under the plan. This group delivers and removes flasks, patterns and rigging for molders and delivers cores, where helpers are not used. Their allowed time is based on

the work to be done and they, of their own initiative, have worked out plans to expedite their work. They are making considerable savings for the company and participating mutually in the savings so made.

Likewise the cleaning and chipping are on time rates, giving the men in these departments opportunities to make savings and to participate in them. Here considerable difficulty was encountered at the start in meeting the rates set. But, with the help of the men themselves, the work was soon humming along well above the minimum rate, allowing a profit for all concerned.

Windows are now washed on this business plan, but the windows along the craneways are washed by the crane operators. This part of the plan was adopted because the bare trolley wires of the crane system are located just below the sills and, owing to the traveling of the cranes back and forth, safety considerations were of prime importance. Each crane operator was given a contract to maintain the windows in his area in transparent condition, and thus he participates in the new system.



SUPERVISORS' Bonus Chart Used in Foundry Work. Dotted line shows how it is used. With 10 per cent departmental efficiency and 5 per cent bad castings, at 4.5 cost, the bonus is 4.4 per cent. The horizontal line from 10 at left reaches the vertical 5 line, then slopes parallel with the two diagonal lines until it reaches 4.5 cost, after which it runs horizontally to the bonus scale

As an example of how improved methods result from the system, mention is made of the stack gang finding it difficult to meet the rates set, for a period of several weeks. Concentrated effort to eliminate waste effort won out, however, and the rate was more than made. This was achieved by improvements in the bottom drags and other simple improvements. Now the stack gang participates to a considerable extent in the savings effected.

Knowing What Castings Actually Cost

Another vital factor associated with the high-quality production at decreased cost is that the exact cost to the company of every casting made is predetermined. This is accomplished by merely adding the costs of each operation, for by the nature of the system these costs cannot be exceeded. This knowledge of the exact cost of every casting has shown many glaring and almost ridiculous disproportions in the blanket tonnage selling prices that still plague the gray-iron industry.

It is now known at the Standard Foundry Co. which items are profitable, which are non-profitable, and the extent to which they are one or the other. Comparisons between the costs of different methods of molding, and between small orders on benches, machines and floors, are easily made by setting the rates both ways and then choosing the lower of the two. The value of combining small pieces in the most efficient-sized flasks is similarly determined.

Tonnage per man in all departments has increased over 50 per cent. But, while the workers were achieving this result, the management conducted an active and successful campaign to increase the business an equal amount, to obviate the hardship of laying off men. In spite of adverse business and political conditions, the additional 12 per cent still needed to counterbalance an additional production increase of a like amount, expected as the system gets into smoother operation, is now assured.

It should be noted that the workmen are not the only men who work on the new system. The plan has been extended to apply to the supervisors as well. For the utmost good to be achieved, it is believed all should participate in the system. How the supervisors may earn the bonus is determined by the supervisors' bonus chart, reproduced herewith.

Supervisors' Bonus Based on Their Service

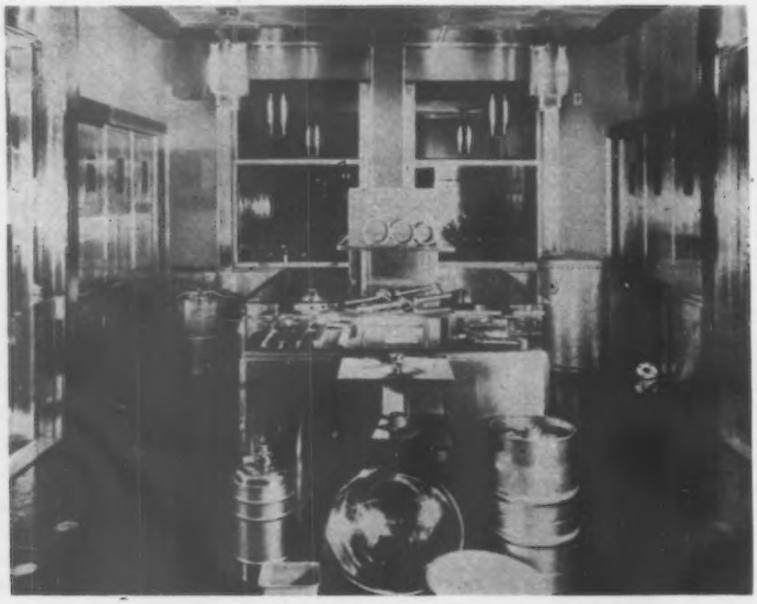
Their bonus is automatically determined, as shown by the example and dotted line on the chart itself. Cost figures are different for each department, depending on the ascertained reasonable cost of the part of the work done in each department. By noting the bonus earned, the chief executive and directors can evaluate each supervisor's services. By scrutiny of the figures necessarily compiled to use this chart, a complete picture of the effectiveness of every department is obtained. The supervisors are paid in proportion to their worth, and they know, and the company knows, their efficiency. It keeps interest unfailingly on quality and cost.

Ogden L. Mills raised the question, in a recent address, how long 7 per cent of the world's population can continue to consume 48 per cent of the coffee, 56 per cent of the rubber, 72 per cent of the silk and 75 per cent of the automobiles of the world.

Uses of Chrome-Nickel Alloy Shown in Special Exhibit

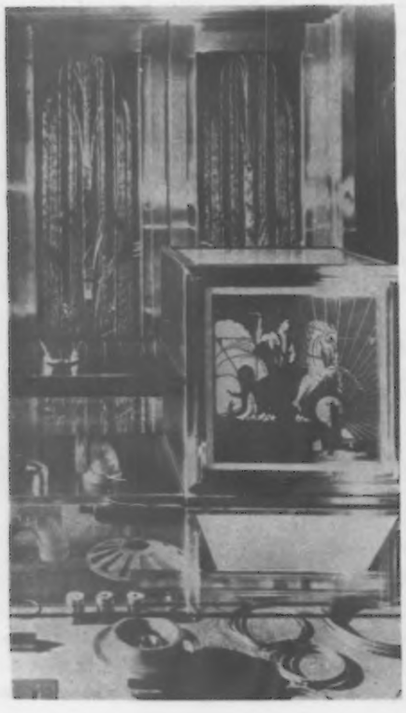
A STRIKING exhibit of Nirosta steel has been assembled in the New York Central Building, 230 Park Avenue, New York, by the Krupp Nirosta Co., Inc. The exhibit room is completely paneled with high-chrome-nickel-alloy steel sheets, satin finished, and the products displayed widely represent the 48 melting, conversion and casting licensees of the process.

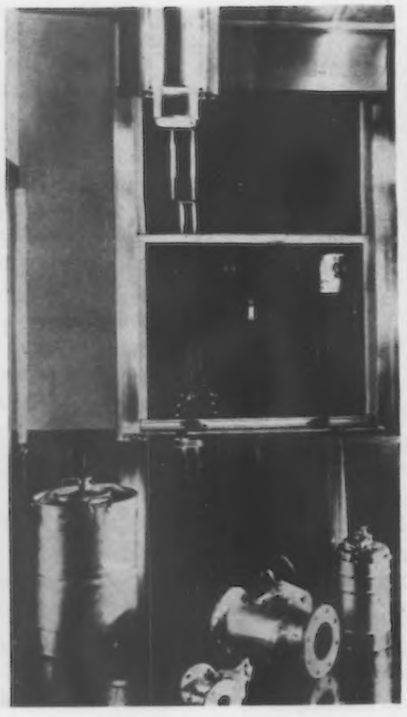
Double doors in the room are built up of a central panel, cast in one pair and etched in the other, with pressed metal frames. Bordering the ceiling are etched tiles with a red background. Sheets on the ceiling have been applied in a modernistic design and there is a four-pointed star in the center.

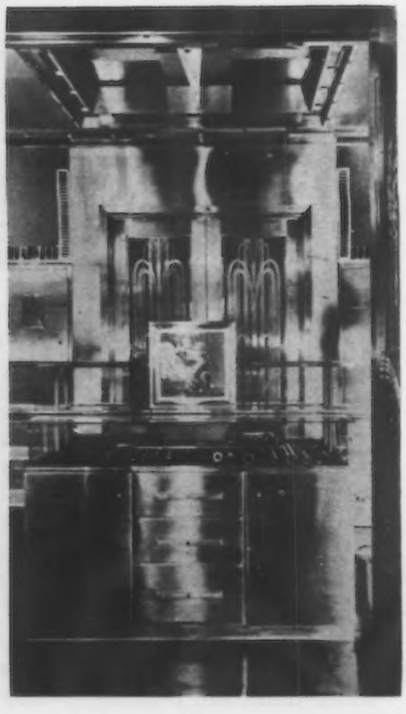


Displays are in show cases, the metal parts of which are formed of Nirosta, and in wall cabinets with doors of the alloy. There are samples of cast, rolled, drawn, spun, welded and etched Nirosta. Corrosion-resisting seamless pipe is shown for use in oil cracking and two Nirosta steel drums demonstrate its deep drawing and welding qualities. Sections of tubing in the display range from 11 in. O. D. down to hypodermic needles and there are samples of wire from ordinary sizes to those of less than 0.001 in.

While the room in itself is an example of the decorative possibilities of the metal, the display shows both utilitarian and attractive uses. Among the etched Nirosta panels shown is that of a horseman against a background of colored lacquers.







Quality Steel Bar of Today Is Result of Long Period of Evolution

By C. L. ALTEMUS

THE most universally used steel product is the bar. The many purposes to which it is put have set up exacting and varied requirements which the steel mills have endeavored to meet through painstaking work in the laboratory, the steel department and the rolling mill. The author traces the developments which began before the days of steel to show the industrial influences which have kept steel makers everlastingly "at it" to produce steel bars of dependable quality to meet all requirements.

Whether your experience goes back to the days of the iron bar or is more recent, there is much of interest to the user of bars in this brief narrative of the progress of the "art of steel making."

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UPWARD of 25 years ago this writer sat at an obscure desk in an obscure corner of a not so obscure steel mill in western Pennsylvania, wondering at the variety of steel bar grades of the day. He had just read the following paragraph from a small pamphlet issued April 13, 1843, by Messrs. Hird, Dawson & Hardy, proprietors of the well-known English Lowmoor Iron Works:

"Messrs. John Finch & Sons of Liverpool are now, and have been for many years, the sole agents in Liverpool for the sale of our iron, and having given them a further commission extending to the United States of America and Canada, Mr. Finch is induced to wait upon you at our request, and we trust the reputation which our fabric has acquired among engineers, boiler makers and railway companies of the highest standing in Europe will induce parties residing in America to favor Mr. Finch with a trial order, which we feel confident, when worked, will give satisfaction and insure further commands."

Then was added a list of iron and steel grades they were prepared to furnish, among which were several specifications, so called, as follows:

Bar Iron	Steel
Ordinary Merchant	Blistered
Scotch	Swedes
Staffordshire	Spring
Best Rolled	Single Shear
Best Hammered	Double Shear
Scrap Rolled	

All that the manufacturers claimed for their iron and early steel products was further established by the flattering testimony from such honorable users as the Royal Mail Coach Factory of Gray's Inn Lane, London.

Early Attempts at Classification

Evidently these grades met the manufacturing demands of Europe and the world in the 1840's. The pamphlet indicated an attempt at classification.

As another interesting side light on intermediate developments, I quote from a heavy volume entitled "American Locomotive Engineering," by Weissenborn, published in New York about 1875:

"Boiler making is now in process of rapid transformation, and the use of iron will soon cease altogether. Several important announcements have conduced to this: In the first place, Messrs. Corning, Winslow & Co. of Albany Iron Works have advertised their ability to supply semi-steel of a warranted tensile strength of 90,000 lb. to the square inch, at price of Lowmoor plate. Then Howell's homogeneous metal and Firth's puddled steel begins to be imported; and finally the Bessemer process has been perfected and applied to the manufacture of large quantities of the metal. The experiments in regard to the Bessemer process commenced in 1856; after meeting with much opposition and ridicule, the subject took hold of the attention of the public, and finally, it being ascertained that the plan was as successful and satisfactory as it was ingenious and beautiful, the Bessemer steel is fast taking its place as a first-class material in the markets of the world."

Bessemer Process Amplified Uses

But years had passed and many changes, some of revolutionary proportions, such as the Bessemer process, had wrought wonders in the steel industry and greatly amplified the several uses of steel bars. For his own information and satisfaction, the author wanted to classify and define the growing diversification of important uses to which this branch of the mills' product was rolled to serve. The general classification was, of course, "merchant bars," so called because they had with more or less success passed all producing and finishing operations within the mechanical capacity of the mill and were then ready for

the merchants' or manufacturers' racks for further sale or manipulation, one rather liberal composition serving many purposes.

This general classification naturally led to divisions and even to subdivisions and the diversification still goes on. At that time manufacturing requirements were relatively narrow and bars were ordered according to somewhat general use. The wagon and buggy manufacturer, except for axles and springs perhaps, could take liberties with phosphorus and sulphur in his bar orders, and so could the agricultural implement maker, but to a somewhat less degree.

The doubtful purchaser asked the manufacturer for a reliable quality of steel suitable for a given purpose and the manufacturer would suggest a grade which, in his opinion, was best suited for the service intended. This suggestion was based wholly on the manufacturer's careful observance of the past performance of his "fabric" the same as our English friends had done years before, through the tedious but sure method of "trial and error."

Based on such an experience, how could some definition be made for general trade purposes? After reviewing all files, indulging in much correspondence and holding many conferences, accompanying tabulated classification seemed to offer a fairly reliable division.

Bessemer Bars First Sinews of a Machine Age

This was an attempt to define known requirements and a suggested guide for prospective customers to follow in the purchase of proved grades of steel. Since then the elimination of many harmful manufacturing practices and a more definite control of metallurgical reactions has gone steadily forward.

During this period in the United States the gradual change from the use of iron to steel had been brought about without serious difficulty. Government engineers, railroads and industrial concerns began to insist that their requirements should be met in every respect, thereby compelling the steel maker to give added attention to every operation in his manufacturing processes, all of which involved some new equipment, revised methods and increased cost.

At the opening of the present century Bessemer steel was an aging king, with definite indications on all sides of a coming new potentate, the open-hearth, while the electric furnace spluttered in swaddling clothes. But those Bessemer bars were the first sinews of a machine age at its dawn. How well they served their generation is an open record, a romance in steel. Some continue unrivalled to this day, notably screw stock and certain wire grades. Agricultural implements, early railroad equipment and numerous machines and machine products were born of those bars and still find in them many points of useful contact.

The varied extension of manufacture and use of this product early showed that the quality of the finished bar did not depend solely on chemical composition, but that the manipulation in rolling or forging and the finishing temperatures were factors of no little importance. This fact gave rise to the need of a scientific way of defining more precisely the physical and chemical properties of the increasing number of steel grades to meet more and more service demands.

Specifications Began to Appear

Accordingly, "specifications" appeared in greater variety. Among the first to issue such were the railroads, and they were as varied as the individual engineers of each road differed in training and experience. Some interesting things might be written about an early specification conference attended by railroad engineers and steel manufacturers. Many difficulties would be revealed and some overcome. What was sought and partly found was a "way" or method to the production of reliable physical properties for a definite service, properties which could be duplicated with reasonable assurance by responsible manufacturers who would follow a given formula or specification. An idea of what was done to define the manufacturing and service requirements of these early soft Bessemer bars may be gathered from the following specification:

"To be manufactured of Bessemer steel containing not over 0.10 per cent carbon, 0.10 per cent phosphorus, or 0.06 per cent sulphur, with an ultimate strength of not over 64,000 lb. per sq. in., and 25 per cent elongation in 8 in. The bar to bend flat cold without showing any cracks on the outside of bend."

A comparatively simple statement!

Carbon Determined Grades

Carbon was the great dictator of class distinction in those bars and the several grades were determined, largely if not wholly, by the amount present. They did not offer any baffling engineering, metallurgical or marketing problems, other than the usual premium which all refinement exacts in its careful production. They satisfied the demands of men and machines up to the opening of the twentieth century,

EARLY CLASSIFICATION OF BESSEMER STEEL BARS FOR VARIOUS USES

Grade	Carbon‡	Manganese	Elastic Limit Lb. per Sq. In.	Ultimate Strength, Lb. per Sq. In.	Elongation Per Cent in 8 In.	Reduction, Per Cent
Rivet	0.08	0.30	38,000	58,000	31.0	65.0
	0.10	0.50	42,500	64,000	28.0	55.0
Soft Bridge ..	0.10	0.40	40,000	58,000	30.0	65.0
	0.13	0.60	43,000	66,000	27.0	53.0
Screw	0.10	0.50	40,000	60,000	29.0	60.0
	0.15	0.80	46,000	70,000	25.0	50.0
Medium Bridge	0.12	0.45	41,000	60,000	28.0	59.0
	0.16	0.70	46,000	70.000	24.0	50.0
Common Forge	0.14	0.70	43,000	68,000	26.0	52.0
	0.22	0.95	49,000	75,000	24.0	42.0
Foreign Axle..	0.16	0.75	46,000	70,000	25.0	50.0
	0.24	0.95	51,000	80,000	21.0	40.0
Tire Steel.....	0.20	0.75	48,000	75,000	24.0	48.0
	0.30	0.95	54,000	85,000	18.0	38.0
Toe Calk	0.25	0.75	52,000	82,000	22.0	46.0
	0.35	0.95	56,000	92,000	18.0	39.0
Knife Back ..	0.32	0.80	55,000	88,000	21.0	40.0
	0.40	1.00	60,000	98,000	17.0	35.0
Finger Bar ..	0.38	0.80	58,000	95,000	18.0	40.0
	0.45	1.00	63,000	105,000	15.0	30.0
Hoe Steel	0.38	0.80	58,000	95,000	18.0	39.0
	0.48	1.00	66,000	110,000	14.0	29.0
Rail Steel ...	0.45	0.80	62,000	100,000	15.0	30.0
	0.55	1.10	74,000	125,000	11.0	23.0
0.50 Carbon*..	0.45	0.80	66,000	105,000	14.0	29.0
	0.55	1.10	74,000	125,000	12.0	21.0
0.55 Carbon†..	0.50	0.85	70,000	110,000	13.0	25.0
	0.60	1.10	76,000	130,000	10.0	19.0
0.60 Carbon...	0.55	0.85	72,000	120,000	12.0	23.0
	0.65	1.10	77,000	135,000	10.0	18.0
0.65 Carbon...	0.60	0.85	75,000	125,000	11.0	20.0
	0.70	1.10	82,000	145,000	8.0	16.0
0.70 Carbon...	0.65	0.85	78,000	135,000	10.0	18.0
	0.73	1.10	88,000	155,000	7.0	13.0

*Plow steel. †Cultivator disks. ‡Phosphorus under 0.10 per cent; sulphur, 0.06 per cent for the lower carbon and 0.10 for higher.

when a new day began. The open-hearth furnace was now assuming the role of a tonnage and quality producer. Its product was much better adapted to meet the growing insistence for chemical or physical refinements; in terms of the pig iron, that is the ore available.

Up to that time the automobile was a laboratory product or the experimental output of an abandoned stable. This "new fangled contraption" was to revolutionize the age-old need and hunger for transportation. Its astounding development rapidly created an imperative demand for ever tougher and stronger sinews. The commercial carbon steels of the day strove to give the early models shape as well as substance, with what we would now term ludicrous success.

The highest physical properties of the best known straight carbon steels were taxed to their utmost to meet and successfully sustain many old forces intensified in new combinations. These requirements soon created a need for physical properties far beyond the capacity of the best known combinations of carbon and iron in solution, nicely adjusted by heat treatment, and so the structural requirements of the modern automobile have created an "alloy age," or shall we say "interim," which suggests a shorter lapse until even greater toughness is obtained and confined within lesser areas and weights.

But while the service requirements of the major and more vital parts of an automobile can be satisfied only by the superb physical properties of alloy steels, the requirements of many other parts are still within the service limits of straight carbon steels and we are proscribed in this article to their consideration only.

PHYSICAL defects in steel bars, which formerly existed, have largely been eliminated by new methods of teeming, bottom pouring of ingots and the use of sinkheads and tarring of molds.

¶ Rolling or reduction processes have been vastly improved in recent years, and a 7000-lb. ingot today is reduced to fine quality merchant bars in one-third the time formerly required, and in finely graded reductions to insure sound physical condition.

¶ American mills have spent large sums in replacing obsolete equipment and in developing new methods of production and research to produce the perfected bar in use today.

¶ Exacting requirements of present-day users, however, leave much to be accomplished in the future—a challenge to the genius of the younger engineers.

Four Factors Control Quality

The four factors affecting the quality and physical properties of steel are the method of manufacture, chemical composition, deformation process and heat treatment.

Volumes have been and will be devoted to these divisions; we are attempting here a generalization only of superior modern carbon steel bars. So many and varied are the uses of such that we cannot present a detailed description of each class but will select one fairly representative and having extended use, namely, 0.15-0.25 carbon, as produced under today's specification S. A. E. 1020. Carbon, 0.15-0.25; manganese, 0.30-0.60; phosphorus (max.), 0.045; sulphur (max.) 0.055.

"This grade is known to the trade as 0.20 carbon open-hearth steel and often as machine steel. It forges well and machines better than S. A. E. 1010 and 1015 (0.10 and 0.15 carbon), but should not be considered as screw machine stock. It can be used for a very large variety of forged, machined and case hardened automotive parts where strength is not paramount. Steel of this quality can be drawn into tubes and cold rolled into forms and shapes for automotive parts. It can be also safely used interchangeably with S. A. E. steels 1010 and 1015 for cold worked shapes that do not require deep drawing."

If one word only could be used to sum up the basic quality in all steel it might be the word "toughness," but after the necessary minimum of mill operations have been used to produce this basic quality the question arises: "How shall it be modified to meet a particular service?" The answer, of course, is heat treatment or possibly case hardening in the matter of lower carbon steels.

Forging Most Likely to Show Defects

A reasonably established procedure in making sound forging steel to this specification is by the open-hearth process with a scrap and pig iron charge, which is under better control than some other charge combinations and less violent in reactions, a condition which should at all times be avoided in the production of sound, dense steel. An essential requirement of this steel is its ability to flow freely in any direction under the hammer without cracking or showing evidence of any seams, which in turn depends largely on very careful deoxidation. Such a defect is not always revealed in ordinary hot rolling but almost invariably in forging.

Having produced a bar of required soundness under a given specification it should perform satisfactorily under the hammer and when finally formed may or may not be subjected to heat treatment. From this little additional strength is derived in the case of low-carbon stock except possibly in small sections, but a very desirable refinement in grain structure is established, relieving all internal strains set up in forging and bringing about more even ferrite distribution.

And so, in response to modern demands for a greatly perfected steel bar over its forerunner of 25 years ago, American mills have spent large sums of money in replacing obsolete equipment and in developing new methods of production and infinite care in research. Their efforts have produced a bar of forging grade which is meeting the exacting service requirements of a new era and with eyes toward the future, involving a host of new and finer requirements in the realm of airplane and dirigible mechanics, they are in the laboratory, testing room, field and air anticipating tomorrow's super-service demands.

It is a majestic industry, and the progress made in every phase of it since the opening of the present century has set a pace such as the world has never seen, and yet much remains for the future to accomplish. To mention just one project: as yet predetermined properties, as measured by accepted tests, have not been completely correlated with exacting service demands. Here is an interesting problem for the younger engineers of today. The whole history of the art, for steel making is an art, is a fascinating medley of mechanical and metallurgical challenges, met and mastered.

Materials Handling and Storage in Foundry Operations

NECESSITY of mechanical devices in a foundry increases as melt exceeds 30 tons per run, according to W. M. Booth, Syracuse, N. Y., in a paper read before the American Foundrymen's Association. The following are some of his contentions:

If we have a unit load greater than 400 or 500 lb., it has been our experience that power of some sort should be employed to transport materials. Electric lift trucks leave nothing to be desired for many foundry operations. They will carry heavy loads, may be operated with trailers, are free from fire risks and can be operated by one man, who need not be paid expert wages. Roller conveyors are inexpensive to install, are operated manually or by power, and are capable of handling loads to five or more tons.

Because a molder is a specialist, he commands high wages. Mechanical power and cheaper labor thus should be used wherever possible to supplement his efforts. It is not necessary in many jobbing foundries to install continuous-molding equipment. But we feel that all foundry managers should consider the advisability of mechanical elevation and mixing of sand, with a gravity supply to each bench or machine. The two- or three-story foundry may work out very successfully in connection with sand and castings movement by gravity.

A northern foundry layout must include provisions for frost, rain, snow and ice. Coke and iron should be held on the charging floor at least two days before being used.

Ample Storage Space Near Cupola

Build an ample cupola floor and store upon this constantly at least two days' supply of charging materials. Let the iron, scrap, coke and limestone flow by gravity from bins well above the charging floor into charging buckets; or, in case the climate is satisfactory, make up the charge adjacent to the railroad siding, lifting directly to the cupola.

Continuous pouring and continuous molding reduce the necessary floor area of the foundry by 50 to 70 per cent. By divorcing molders from all duties but making molds and setting cores, we may increase their output by 200 to 300 per cent; i. e., a molder who formerly set up a floor of 110 molds may, by the new system, make from 300 to 400. The volume of molding sand is largely decreased. All castings and sprues are delivered to the cleaning room at one or more convenient points, while night labor is abolished. The moisture content of sand is kept constant, as it is controlled by one man who makes several tests each day. The permeability and strength of the sand likewise are checked. Hard spots in iron are eliminated through the absence of water in the molds, formerly added by the operator to pack the surface.

Need Study in Cleaning Rooms

In no part of the foundry has less attention been paid to economical control than in the cleaning rooms. These should be studied, to decrease hand movement. Pass the castings through chipping and grinding departments waist high, from left to right or the reverse to accommodate the workmen, or hire men who can naturally handle their work as the machines are set up.

Systematically, remove daily all waste from the foundry—cupola drop, slag, dirt, broken cores and worn sand.

Movement of materials in any foundry operation should be placed in the hands of a competent man, with such assistance as he needs. He should travel extensively, to see how his friends and competitors handle similar problems.

Use gravity flow of materials wherever possible, lifting these in bulk mechanically and allowing them to pass downward as needed.

The Government helium production plant at Soncy, near Amarillo, Tex., produced during May the largest quantity of helium ever turned out in one month by any helium plant, according to the Bureau of Mines. The plant produced 1,230,350 cu. ft. of the noninflammable gas used in airships, on operation of only about 60 per cent of the plant's capacity. The net operating costs for May were $9,352, or $7.76 per 1000 cu. ft. of contained helium. At the May costs, helium to fill one of the 6,500,000 cu. ft. airships now being built for the Navy could be produced by the Amarillo plant with net expenditure from the Treasury of about $50,000. The entire development of production of helium has occurred since 1917. Prior to that time helium had been obtained only as a scientific curiosity in laboratories. Probably the total quantity isolated in the whole world did not exceed 100 cu. ft. and the cost of producing it was from $1,700 to $2,000 per cu. ft. Now the Bureau of Mines is prepared to produce it at a rate of 2,000,000 cu. ft. per month at operating costs well below 1c. per cu. ft.

How Large Crucibles Are Made

A NEW JERSEY Plant Produces Largest Graphite Units in the World — Careful Molding, Drying and Burning Necessary.

By RALPH BROWNE
Brown Instrument Co., Philadelphia

REFRACTORIES are playing an increasingly important part in modern metallurgical practice as well as in modern furnace design. Longer and longer service is being expected from fire brick, refractory shapes, linings and crucibles, and progressive manufacturers are meeting and anticipating the demand.

The Bartley Crucible Refractories Co., which began business in 1908 as the Jonathan Bartley Crucible Co., takes justifiable pride in keeping abreast with the changing conditions and requirements of modern practice. It maintains a well-equipped ceramic laboratory under the immediate supervision of Walter L. Shearer, consulting ceramic expert, retained by several other ceramic plants in Trenton and vicinity. Experimental work is constantly in progress in this laboratory as well as in the plant.

World's Largest Graphite Crucibles

Rapid advances are being made in the composition and production of crucibles and special shapes. The company is now producing the largest graphite crucibles in the world. They are each capable of holding 4000 lb. of zinc. Also, this plant has achieved the position of being the largest single unit crucible plant in the country.

How Raw Materials Are Obtained and Used

The graphite is imported from Ceylon and Madagascar, and the clays are secured from a number of sources, both foreign and domestic. The graphite is bought under special specifications and then refined at the plant to develop the particular qualifications required for the processes involved in the manufacture of the crucibles. The clays used must be carefully blended to develop the special characteristics of each material. All raw material is analyzed before it is unloaded into the bins and then dry ground before blending.

A considerable quantity of the several blends of clays is kept available, as they must be proportioned and mixed and then allowed to season before being worked up into shapes or crucibles. A working or softened supply is also kept ready for the final mixing. When preparing stock for working into crucibles or shapes, the blended clay and refined graphite, or clay and special refractory, such as magnesium oxide, silicon carbide, zirconium oxide, etc., are brought by conveyor to the upper floor where the proportioning and mixing are done in specially designed pug mills. These mixers discharge through a chute to another set of grinding mills on the lower floor where the final working is given to the batch.

Sweating or Aging Process for Mixtures

From these mills the prepared product goes to what is known as the "sweat rooms," where it is allowed to remain at constant temperature and high humidity for varying lengths of time, the period varying with the character and amount of clay in the mix. This process corresponds to the aging process in the preparation of fine clay for china and pottery manufacture and serves to develop the colloidal matter in the clay, thereby materially increasing the plasticity and workability of the mass. It ordinarily takes about a month for clay to pass from raw material into the finished products.

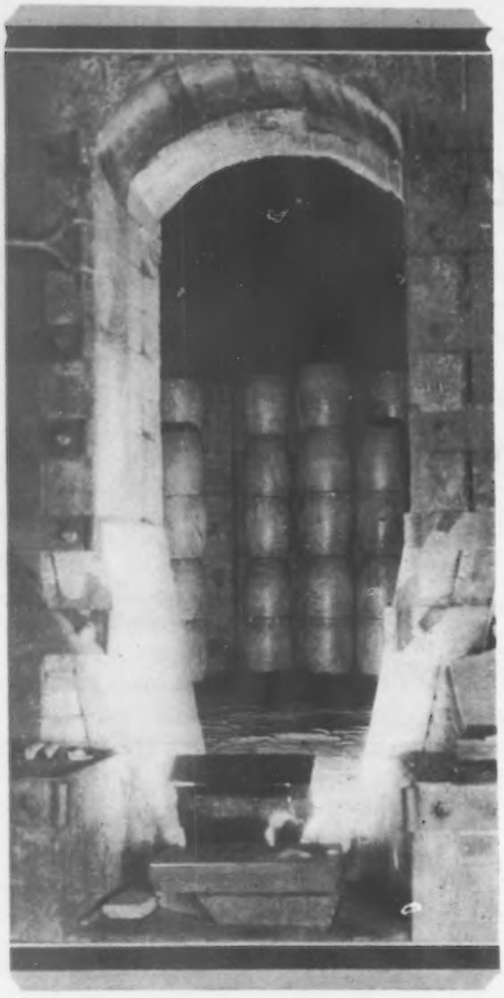
From the sweat room the prepared material is

taken in slabs or chunks, depending upon the mix, to the molding rooms for shaping into crucibles, liners, special shapes, etc. Several processes are followed in this operation, depending upon the material being used and the shape being produced. The operations have been highly developed at this plant and experimental work is constantly in progress.

Molds Are Used to Form the Crucibles

Numerous types of molds are used, depending upon the mix, the basic practice being to use specially designed and treated plaster molds. These various molds are designed to give the proper "feed lines" to the walls of the pots and crucibles so that they will not break under the stresses set up in drying and burning.

On the shipping floor, one may see rows of magnesia pots of 2000 lb. capacity for use in electric furnaces; crucibles of all shapes and sizes, both acid and basic; liners, and a wide variety of refractory shapes. Here, too, will be seen the great graphite crucibles. These giant crucibles have been brought out during the past two years, and we are told that it took 18 months of development work to get the proportions of graphite and clay balanced, to obtain the lines best for the crucible, and to plot the most satisfactory firing curve.



Crucibles Stacked in the Kiln Ready for Firing

Largest Graphite Crucibles Ever Made. Store Room for All Sizes (Below)

Drying Rooms Are Humidity Chambers

After molding, the crucibles or shapes are carefully moved to the dryers. The drying rooms are particularly interesting as they are unique in being humidity chambers rather than dry heat dryers. The humidity is maintained at a high point. This, of course, is controlled by a specially devised system of heating and ventilation. As a result, shrinkage and breakage are prevented in the drying process, and the ware is made ready for firing.

From the drying chambers the various units go to the kilns for firing. First of all the pots or crucibles must be slowly heated and thoroughly fired. This is done by stacking them in the kilns, as shown in an accompanying illustration, the total time in this kiln varying according to the size and type of unit being treated. When the units are thoroughly fired, they are either transferred to another spe-

(*Concluded on page* 400)

Rolling an Ingot into a Billet in 19 Carefully Planned Passes

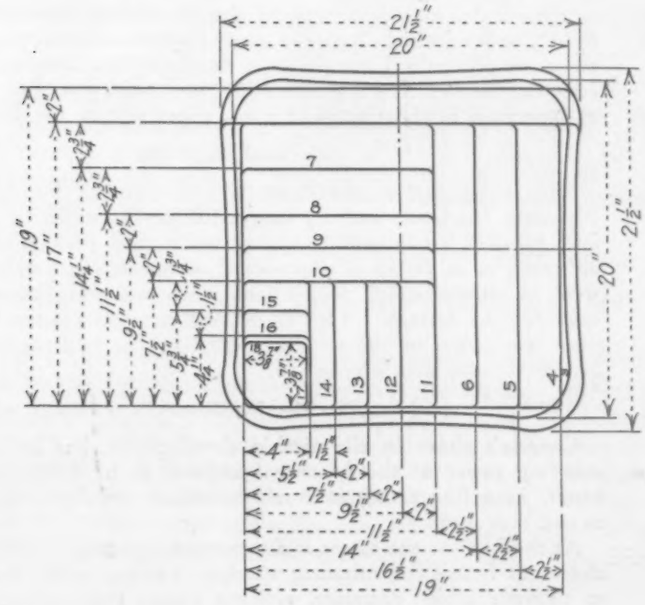
IN a monumental paper on the theory of rolling plastic materials, F. G. Gasche, combustion engineer, Lackawanna plant, Bethlehem Steel Co., contributed some observations on the design of a motor drive for a 34-in. reversing blooming mill. The paper was presented before the meeting at Buffalo, June 17, of the Association of Iron and Steel Electrical Engineers. What he had to say was in part as follows:

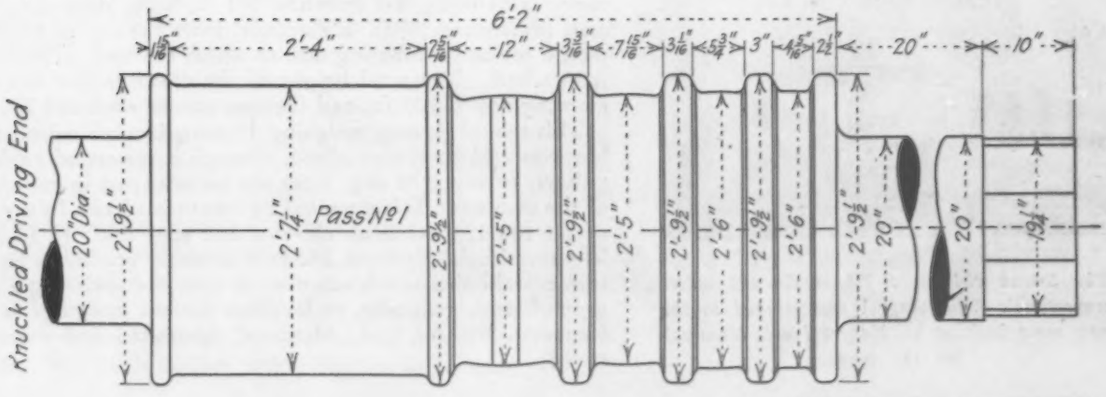
In 1924 it was proposed to replace a reversing steam engine by a suitable electrical equipment.* Opportunity developed for changing the size and shape of the ingot, modification of the rolls, and a considerable alteration of the rolling schedule, all for the sake of obvious advantages. Appended diagrams show the surface contour of the rolls and an end view of the tapered ingot, with lines superimposed thereon whereby the sectional dimensions of the ingot after each pass were specified.

Nineteen passes were required to produce a billet from the ingot, the last two being straightening operations. The section diagram is so developed that the quarter turning of the ingot is directly shown, with the consequent section of the ingot after the succeeding pass was completed. The tabulations give essential numerical values which enter into all subsequent calculations.

Establishment of such a rolling schedule is possible through knowledge of the requirements of mill operations, which will not be amplified at this time. But it must not be concluded that any fanciful arrangement of passes, drafts and roll grooves will allow a highly

*See THE IRON AGE, April 15, 1926, page 1051, for description of the new equipment.





Profile of Roll and, Above It, Rolling Schedule for Reducing Ingots to 4-In. Billets. Passes 1 to 6 are rolled in the bullhead pass, No. 1; passes 7 to 10 in the 12-in. groove; 11 to 14 in the 8-in. groove; 15 to 19 in the 4-in. groove. The 5¾-in. groove, idle in this case, is used when rolling other sections

efficient rolling mill operation.

Accepting the rolling schedule as the operative requirement, there is still the necessity of applying all the judgment that previous contacts and mill experience would make available, in assigning suitable rotative speeds of rolls for each operation, not to overlook the dominating character of the small time intervals between the passes and for general manipulations of the mill and the ingot.

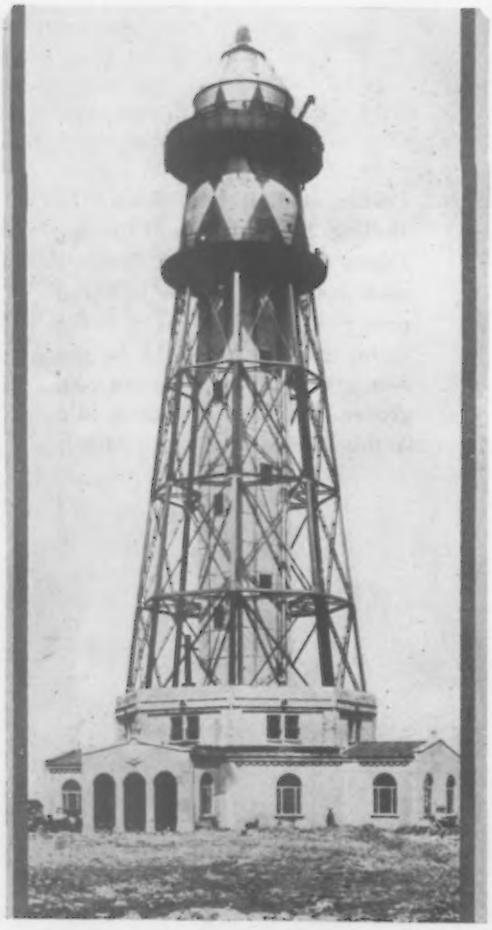
On account of the taper of the ingot, the first three passes impose a variable resistance to the rolls and driving mechanism. Average sections cannot be safely employed in numerical substitutions in the several formulas, though mean values for torque and work may ultimately be applied when the service of a motor-generator set is to be specified.

Pass No.	A (Sq. In.)	B (Sq. In.)	A / B	Distance Between Rolls, In.
1	443	408.5	1.085	...
	382	355.0	1.075	19.0
2	408.5	367.5	1.111	...
	380.0	340.0	1.117	17.0
3	367.5	....	1.137	...
	340.0	323.0	1.052	19.0
4	323.0	280.5	1.151	15.5
5	280.5	238.0	1.178	14.0
6	238.0	195.5	1.217	11.5
7	195.5	163.9	1.192	14.25
8	163.9	132.3	1.239	11.5
9	132.3	109.3	1.211	9.5
10	109.3	86.3	1.267	7.5
11	86.3	71.3	1.210	9.5
12	71.3	56.3	1.267	7.5
13	56.3	41.3	1.354	5.5
14	41.3	30.0	1.366	4.0
15	30.0	23.0	1.304	5.75
16	23.0	17.0	1.353	4.25
17	17.0	15.0	1.133	3.875
18	15.0	15.0	1.000	3.875
19	Blind	Blind	1.000	Straightening

Power as Estimated

It was estimated that the work required to produce billets from the ingot, all as specified, would be approximately 24 kwhr. a ton, measured at the switch board. Actual operation of the mill, after the attendants became familiar with all controls, enabled the delivery of a ton of billets with 23¾ kwhr.

Canadian Terminal for British Transoceanic Dirigible Service



The British dirigible R-100 at the end of its transatlantic flight Aug. 1 was moored to the new mast built at St. Hubert Field, Montreal, for the purpose

THE successful completion of a transatlantic flight by the British dirigible R-100 has focussed the attention of the world on this new leviathan of the air and its sister-ship, the R-101, both of which depart in many features of design and construction from the Zeppelin-type developed in Germany. Not only do the British dirigibles differ in design, but they present a departure in the materials used, especially in the R-101.

Stainless Steel in R-101

This sister-ship of the R-100 is now nearing completion at Howden, England, and its successful performance in the air may portend an increasing use of alloy steel for lighter-than-air craft, as its frame is constructed of duralumin and stainless steel in almost equal proportions, with some austenitic alloy used for the fittings. THE IRON AGE gave its readers a complete discussion of the structure of R-101 in its issue of June 27, 1929, more than a year ago.

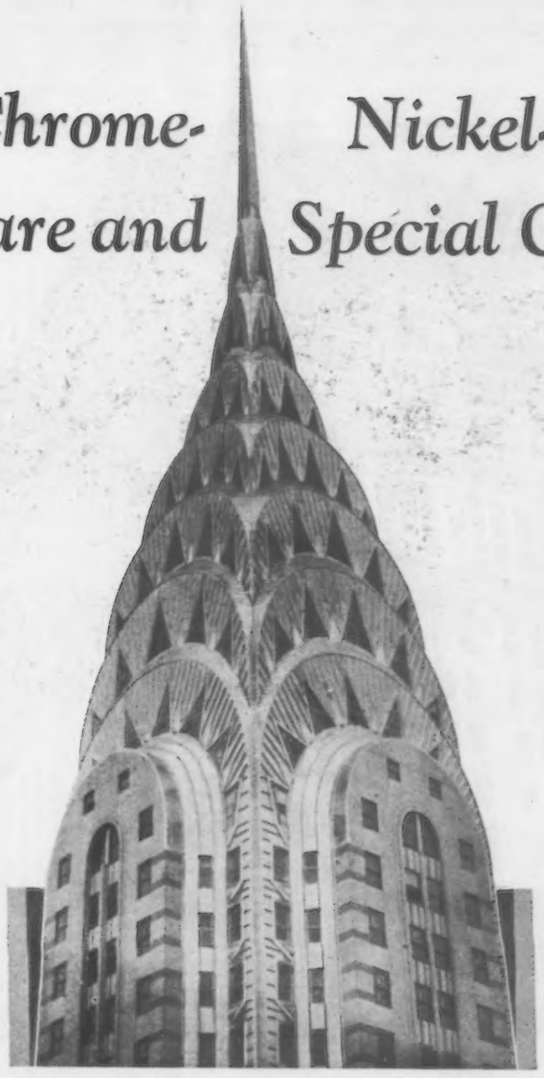
The Mooring Tower

Canada's share in the airship development has included a mooring tower at the Montreal airport, at St. Hubert. The tower, here illustrated, is a self-contained structure, anchored to concrete footings.

At the base of the tower is a two-story building, cruciform in shape, to house the mooring winches, heating plant, etc., and to provide lobby entrance, retiring rooms and offices. The tower is an octagonal structure 171 ft. high, surmounted by a steel plate turret 25 ft. in diameter, from the top of which projects a telescopic mooring arm to which the nose of the airship is attached. The total height of the tower to the top of the mooring arm is 205 ft., and the arm can be extended 7½ ft.

This telescopic arm, weighing 15 tons, is mounted on gimbal bearings and counterweighted, through a system of cables and pulleys, to swing 30 deg. from the vertical and in any position of the compass. It is operated by compressed air. In the center of the tower, there is an elevator and stair shaft 16 ft. square. The searchlight platform, 142 ft. 6 in. above ground, is equipped with searchlights which are used to spot the anchorages on the ground, and, generally, to facilitate airship moorings at night. Canadian Vickers, Ltd., Montreal, fabricated and erected the tower.

Polishing Chrome-Nickel-Alloy Steel Requires Care and Special Compounds



The top of the Chrysler Building is a gleaming needle among the towering buildings of New York.

By CURTIS C. SNYDER

THE growing use of high chrome nickel alloy for products which were formerly given a final coating, such as tin, zinc or enamel, has brought to the metal-working industry the problem of cleaning, polishing and buffing the finished article. Formed and drawn shapes are processed from either a hot-rolled, annealed and pickled sheet, or a sheet that has been given the additional processing of grinding to remove defects on the surface, such as mill marks, open surface, pits, slivers, etc.

If the article being drawn is severely worked or must be annealed during the processing, a pickle finish sheet is usual, as a ground finish is likely to become scratched or galled in the dies, would be scaled in annealing, and the original finish would be of no advantage. In deep draws it has been found that pickle finish sheets handle easier in the dies and do not show the orange peel or pebbled surface as is often the case with the ground sheet.

For flat work, where operations are confined to bending or light drawing, as in table tops, cabinet work, drains, panels, and trim, ground finish sheets may be used to advantage. Such sheets are obtainable with the exact finish desired, and following fabrication all that is necessary is to clean the work thoroughly by any one of several methods, depending upon the ultimate use of the article.

When the finished product is intended for use where it will be exposed to the atmosphere, all possibility of bleeding or rusting of sheared edges should be eliminated and all dirt and foreign matter that may have contaminated the sheet during fabrication should be removed. The usual method is to clean the panel with gasoline and then whiting, after which it is immersed in a 20 to 30 per cent solution of nitric acid at 130 deg. Fahr. for about 20 min. It is then washed with hot water and dried with warm compressed air, and to eliminate further marking during transit and handling it is dusted with whiting.

If the polished sheet is used with protection from atmospheric action, so that danger of bleeding is eliminated, the nitric acid dip may be omitted. When this is done the panel should be cleaned after fabrication is completed and the entire surface should be buffed with green chrome oxide rouge, or a stainless steel buffing compound. Special compounds for buffing have been developed in the past year, and within the past six months considerable improvement has been made in their quality and properties. A number of highly satisfactory buffing compounds are being sold commercially.

Removing Cement and Plaster Stains

During construction of a building it has been found almost impossible to prevent the rustless steel from being splashed with cement or plaster, or both. An investigation was recently made by the research laboratory of a rustless steel maker to determine a satisfactory method for removing the contamination at the same time cleaning the sheet so as not to impair its corrosion resistance.

Samples in the investigation were regularly polished Ka-2 sheets, which had been buffed with chrome oxide rouge. They were smeared with cement and plaster, half and half mixtures of sand and Portland cement, or plaster.

The accompanying table shows the results of tests made with cement and plaster on eight samples of Ka-2 sheets. The cement stains were removed by all cleaning methods except on sample No. 7, where a 10 per cent solution of a proprietary cleaning compound was used for washing and the compound for sample No. 7 was used in buffing. Sample No. 8 was washed with water, dried with a cloth and buffed with No. 4 compound, but plaster stains remained.

The plaster stains were much more difficult to remove but were successfully cleaned from samples 3, 4, 5 and 6. The buffing, however, removes all the stains. No rust marks which could be traced to the cleaning or buffing methods were apparent on any of the samples. The plaster and cement stains were again visible on sample No. 6, following the salt spray test, so it is evident that this method would not prove satisfactory for cleaning. The buffing brings out a medium bright luster, the best buffing results in the shortest time being obtained by the use of a wheel.

Continuous panels of rustless steel rise on each side of the windows in the Empire State Building, New York. Rising to the full height of the building, they required 250 tons of high-chrome-nickel alloy, of which half was "Allegheny" metal and half Ka-2.

Polishing Articles From Pickle Finish Sheets

Polishing and buffing drawn shapes is possibly of greater interest to the metal-working trade than any other features of the processing of rustless steel. The producer of finished products is concerned with obtaining the best finish possible in the shortest time.

It is difficult to determine just what grit should be used to start as there is some variation in the surface of the sheets from different mills. This, however, should soon change and marked improvements will doubtless appear, even in the sheets now considered the best.

Much depends upon the shape of the article being polished. If it is rounded or has curved surfaces so that it can be held in a fixture and spun, as with automobile lamp shells, certain cooking utensils and light reflectors, a slightly finer grit may be used at the start than is the case when an article is unsuited to spinning.

An automobile lamp shell or similar product formed of rustless steel will serve as an example. The shell should be placed on a suitable fixture and applied against an abrasive wheel of No. 150 manufactured grit, artificial grit being preferable to Turkish emery. When Turkish emery is used it should be about No. 120 grit. The abrasive wheel should be of the soft or cushion type and should be used as a grease wheel. Soft wheels are being built up successfully and economically by using worn down sections from buffing wheels as spacers between the layers of abrasive. A spacer should be put between every two or three sections to give the desired result. Polishing wheels should run at 6000 to 7000 linear feet per minute, the r.p.m. of a 14-in. wheel being 1800 to 1900.

High-Speed Buffing Best

When all die marks and surface imperfections have been removed by the No. 150 grit, the article may be transferred to a grease wheel, dressed with No. 180 synthetic grit, after which No. 200 Turkish emery is used with grease. Following this the shell should be ready to buff. As with the abrasive wheels, a very soft buff should be used, set up in the same manner with spacers.

Buffing speed should be faster than for the other wheels, 7200 and 12,000 ft. a minute having been found to give fine results. While this appears to be a wide variation, almost 5000 ft. a min. between the low and high, they are used for actually buffing at these speeds. One, using 8000 ft. per min. states that it gives the results desired, while the buffer at 12,000 ft. claims that he obtains a better color with the higher speed.

Iron Oxide Compounds Undesirable

Special rustless steel buffing compounds should be used, as a compound of iron oxide, such as ordinary

red rouge, is highly undesirable, the metal being likely to become contaminated with the oxide and subject to rust or tarnish. Most buffing compounds now on the market contain no harmful ingredients and salt spray tests of 100 hr. on buffed rustless steel in a 20 per cent solution, show no staining.

Abrasive or buffing wheels which have been used for brass or ordinary steel should never be used on Ka-2 unless they have been completely redressed. Obviously the wheel which has been run on steel might have the same action on the stainless steel as red rouge. The writer's personal experience with a wheel that has run on brass will doubtless be of interest.

An automobile manufacturer using a brass shell was running a number of trial Ka-2 radiator shells. The stainless steel shells passed through the drawing operations successfully and were given to an experienced brass polisher for finishing. Roughed out with No. 150 dry, they were examined and placed on a No. 150 grease wheel, which was being used for cutting brass. Final examination revealed that the shells were spotted over the entire polished surface with what appeared to be etching pits.

The first impression of both the polisher and the foreman was that the steel was pitted or laminated, or had an open surface. The real explanation, however, appeared to be that the presence of the brass on the wheel, the grease, and the heat generated had caused an electrolytic attack on the Ka-2. Of this both polisher and foreman were convinced when a new wheel was used with no recurrence of the etched condition.

The best color is obtained in rustless steel by the use of chrome oxide as a final coloring buff, which is usually applied after all handling has been completed and the article is ready for packing. In some cases, of course, this cannot be the final operation.

Articles which cannot be spun are usually polished beginning with No. 120 grit dry, or grease, as the case permits. Whenever possible it is desirable to change the direction of polishing from one wheel to the next, to assure removal of heavy scratches from the previous wheel. Following the No. 120 grit, the polisher should use No. 150 and the other grades as previously described. For very fine finishes, where the highest possible polish is desired, the article should go from the No. 200 grit wheel to either 3-F flour or No. 320 grit. Sheepskin wheels have been found highly desirable for use in connection with the fine grits used in finishing.

GRINDING and polishing high-chrome-nickel alloy steel requires special compounds and high-speed buffing to obtain the best results. On exterior applications of the stainless alloy the Tampico brush gives a highly desirable finish, of which the new Empire State Building in New York is an example.

The author has been connected with the United Alloy Steel Corporation, later the Central Alloy Steel Corporation and recently the Republic Steel Corporation.

In the issue of July 31, Mr. Snyder discussed annealing procedure, methods of pickling and requirements in drawing dies.

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Forming the rustless steel panels for the Empire State Building in the plant of the United Metal Products Co., Canton, Ohio.

TESTS MADE TO REMOVE CEMENT AND PLASTER ADHESIONS

Sample	Method of Cleaning and Buffing	Results: Cement	Results: Plaster
1.	As smeared, no cleaning or buffing.	No rust stains after testing in salt spray.	No rust stains after testing in salt spray.
2.	Washed with water, dried with a cloth.	Cement stains removed, few water stains and no rust after salt spray test.	Plaster stains not removed. No rust after salt spray test.
3.	Washed with water, dried with a cloth, one-half buffed with chrome oxide on wheel.	Stains removed; buffed side bright. No rust after salt spray test.	Stains removed; buffed side bright. No rust after salt spray test.
4.	Washed with a solution of 10 parts tripoli and 100 parts naphtha, buffed with a cloth, using a compound of 1 part white petroleum jelly and 1 part chrome oxide.	Stains removed; buffed side medium luster. No rust after salt spray test.	Stains removed; buffed side medium luster. No rust stains after salt spray test.
5.	Washed with 10 per cent ammonium hydroxide, and buffed as No. 4, with same compound.	Stains removed; buffed side medium luster. No rust after salt spray test.	Stains removed; buffed side medium luster. No rust after salt spray test.
6.	Washed with 10 per cent caustic cleaner and buffed as No. 4, with same compound.	Stains not removed by washing, but are removed on buffed side. Buffed side medium luster. No rust after salt spray test, but white stains are again visible.	Stains removed; buffed side medium luster. Small stain at edge not caused by the cleaning solution or buffing compound. White stains again visible after the salt spray test.
7.	Washed with 10 per cent proprietary cleaning compound and buffed same as No. 4, with same compound.	Stains not removed except on buffed side, which has medium luster. No marks after salt spray test.	Stains not removed, except on buffed side, which has medium luster. No marks after salt spray test.
8.	Washed with water, dried with cloth, buffed as No. 4, with same compound.	Stains removed; buffed side medium luster. No rust after salt spray test.	Stains not removed until after buffing; buffed side medium luster. No rust after salt spray test.

Care Required in Roughing

A common fault seems to be the use of too fine grit for the first operation and not enough time on the first wheel to reach bottom. This invariably results in an inferior finish, so that the article must go back over the line again. A few minutes longer on the roughing cut saves many minutes in later operations and results in a satisfactory piece of work at the end.

Rustless steels conduct heat much more slowly than ordinary steel or brass and care should be exercised in finishing to prevent overheating of the metal. The heat conductivity of Ka-2 is approximately 45 per cent of that of carbon steel.

On certain products, where welding is necessary, the question often arises as to whether the weld is corrosion resistant as welded or whether it should be heat treated, pickled and ground. For atmospheric corrosion it is not necessary to heat-treat the weld, but for high temperatures and high-pressure vessels the Krupp treatment of 1950 to 2150 deg. Fahr. is desirable. The oxide which forms at the weld, however, should be removed either by pickling or grinding.

Finishing Inaccessible Welds

In some cases it is not practical to pickle the entire article and because of inaccessibility the weld cannot be satisfactorily ground. Under such conditions a wire brush, file or emery cloth may be used to remove the oxide. The weld may then be swabbed with a solution of 90 parts hydrochloric (muriatic) acid, 50 parts ferric chloride and 3 parts nitric acid. This acid solution should be permitted to act for 10 minutes or longer if necessary. After swabbing, the article should be thoroughly washed with water and swabbed with a 30 per cent solution of nitric acid, after which it should be washed with warm water. This method prevents any possibility of oxide film causing rusting.

Certain attractive finishes are being obtained by use of the scratch brush and Tampico brush. Where a high finish is not desired or for exterior applications, where it is advisable to reduce the reflection of light, the brush finishes are coming into wider use. The new Empire State Building, being erected in New York, will be an example of the attractiveness and adaptability of the Tampico finish on its rustless steel decoration. The finish on the rustless steel panels of the building is being obtained by the use of the Tampico brush, following a fairly coarse grit. Cleaning by the nitric acid dip method has been used exclusively on the panels.

American Standards Year Book

Important progress in standardization work affecting mechanical, electrical, mining and other major American industries and railroads is reported in the Year Book for 1930, just published by the American Standards Association. Among the high spots of the standardization movement during the past 12 months, the 104-page book notes:

- Underwriting by industry of $500,000 for promotion of national standardization during the next three years.
- Affiliation of the American Standards Association with the national standardizing bodies of 20 other nations, through the International Standards Association. This body, with headquarters at Zurich, Switzerland, will promote international cooperation in standardization work.
- Increased recognition of the value of national industrial standards in the field of foreign trade.
- Completion of an agreement between the American Standards Association and the United States Bureau of Standards, providing for maximum cooperation between the Government and private bodies in the promotion of industrial standardization.

Membership of the association now includes 43 national technical societies, trade associations and governmental bodies. The association has, up to the present, approved 166 national industrial standards, and projects for 171 other standards are under way.

Heat-Treating Furnaces Distributed in Line of Machine Shop Production

By H. E. SCARBROUGH
General Electric Co., Chicago

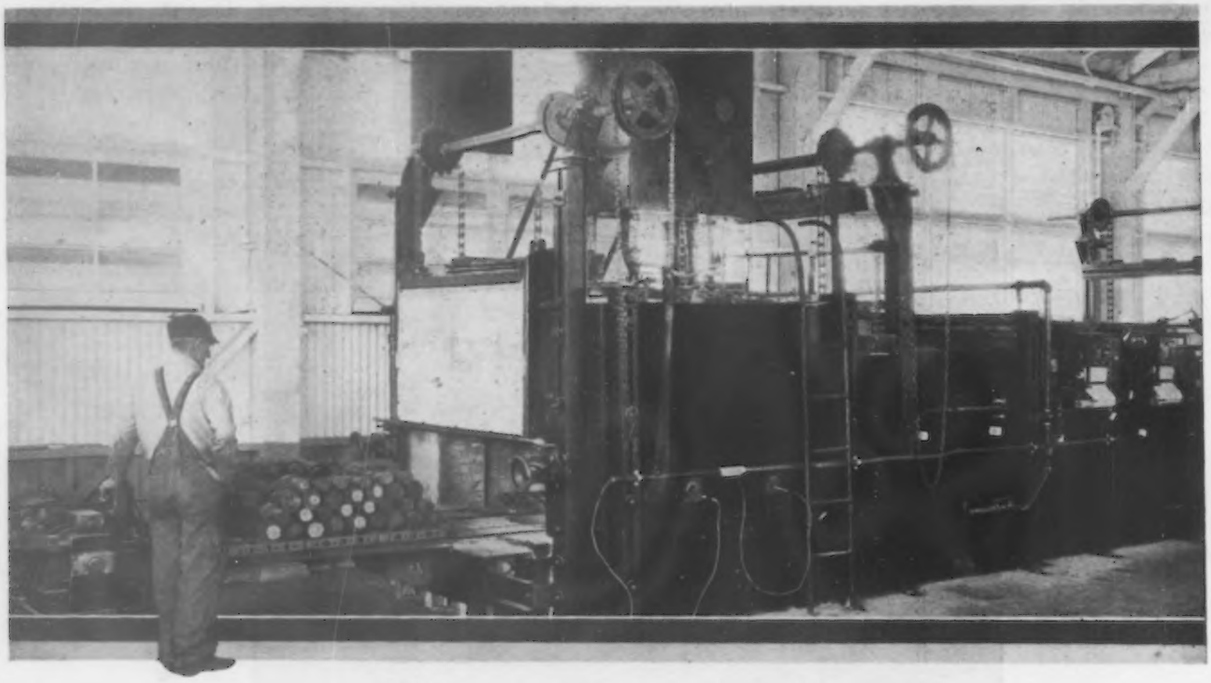
At the time of writing the Caterpillar Tractor Co., formerly the Holt Mfg. Co., had installed or was installing in its Peoria plant a total of 24 General Electric furnaces with a total connected load of 2745 kw. for heat-treating purposes. The furnaces had all been installed right in the machine shop in line of production, and the heat-treating furnace equipment was considered just as any machine tool in the shop. The plant does not have any specific heat-treating department. It is merely a part of the manufacturing process just as any other operation, such as machining.

The furnaces are placed in line of production and in this manner, when it is necessary to expand, another production unit is added, including machine shop apparatus and the heat-treating furnaces. The company is able to make very rapid expansion in this manner without upsetting production schedules which are already in effect, because departments already in operation do not have to be upset.

Each furnace is equipped with one or more control panels and temperature control instruments. The control panels consist of magnetic contactors, control and overload relays and control switches, mounted on ebony asbestos panels, and were originally open type. The automatically controlled electric furnace has proved to be admirably suited to the requirements of the company.

An accompanying reproduction of a photograph shows one type of annealing furnace. Eight furnaces of this type are being used. The forgings are loaded on a light skeleton alloy tray, which is pushed through the furnace on skid rails.

The operator has his hand on the push-button that controls the motor-driven mechanism for pushing the load into the furnace. This mechanism is driven through a rack and pinion and a gear speed-reducing device, with a motor and remote control. When a charge is pushed into the furnace it pushes the charge which has already been heated through the opposite end of the furnace into the first cooling chamber. The next time a charge is inserted, this charge is pushed into the first cooling chamber and the charge which is in the first cooling chamber is pushed on to the second cooling chamber. The furnace has one heating and two cooling chambers.



THE operator, by means of push-button control, directs the load into the electric annealing furnace. Following charges propel the load in succession through two cooling chambers in the after part of the furnace, and finally it is delivered to rollers at discharge end

The automatic control panel for this furnace is shown installed above and on top of the furnace. This method of installation gets it out of the way and it is occupying space on top of the furnace which could not be used for any other purpose. A ladder constructed on the side of the furnace gives easy access to the control panel.

The Leeds & Northrup temperature control instruments, which automatically control the temperature of these furnaces and keep a permanent record of the temperature inside the furnaces, are shown mounted on the side of the furnace.

The photograph at the head of the article shows a 120-kw., 220-volt, 3-phase rotary hearth hardening furnace. The company has a number of these furnaces in operation throughout its shops. The pieces to be hardened are loaded into one door of the furnace. The hearth rotates automatically on a set time basis. The temperature of the furnace is controlled by means of automatic control panels and Leeds & Northrup controlling instruments. The units of the furnace are divided into two control zones to obtain more accuracy and speed up production. The time of travel through the furnace can be varied at any desired setting within the limits of the equipment to give the proper heating time for the various pieces to be heat treated.

The parts with thicker cross sections take considerably more time to heat than the forgings with thin cross sections. It is therefore necessary to vary the speed of the hearth from about one revolution in 15 to 20 min. to as slow as one revolution in 1½ hr. The company formerly used a complicated mechanism for obtaining this variation in speed of the hearth. It was suggested that time-interval relays be used for this service. Such relays have been installed on practically all of the rotary hearth furnaces. This time-interval relay is so adjusted that the hearth moves forward by starting a motor which drives the hearth a predetermined amount.

The time-interval relay then shuts off the power for a given interval and the hearth is allowed to stand still while the operator removes the parts heated, quenches them and then inserts other parts in the furnace. The time-interval relay then functions, starts up the hearth, and moves it forward another space. In this manner the hearth can be moved any desired amount at desired intervals by different adjustments on the time-interval relays. This scheme has worked satisfactorily and all of the rotary hearth furnaces are equipped with these time-interval relays.

With each one of these furnaces is installed a double automatic control panel, of the inclosed type, shown mounted above the furnace. Each one of these rotary hearth furnaces is equipped with a hand mechanism whereby the operator can move the hearth around at any speed desired in case of an emergency. By using automatic control, about all the operator of the furnace has to do is to put the steel to be heated into the furnace, take it out, and put it into a quenching fixture, thereby eliminating the human element. In this manner the company can take inexperienced help and obtain excellent heat-treated parts.

On a lot of the tractor parts after they are hardened, it is necessary to draw the temper. This requires heating the steel up to a temperature between 800 and 1000 deg. Fahr. This is accomplished in furnaces, also here shown, used to draw tack links. After the operator removes the links from the quenching bath or fixtures they are loaded into the pusher furnace shown in this photograph, the loading being at the opposite end of the furnace from that shown in

the photograph. An automatically controlled motor-driven pusher mechanism pushes the links through the furnace at a predetermined rate. The temperature in the furnace is automatically controlled by Leeds & Northrup instruments and contactor panels.

It is interesting to note that the assembly line lies along the side of the drawing furnace. The links are picked up immediately after they are dropped off the pusher furnace and are assembled into the complete caterpillar tracks.

The plant will average somewhere between 8 and 10 lb. of heat-treated parts per kilowatt hour consumed for this purpose. This company feels that it is saving enough in handling charges alone to more than pay for the total power used in the heat treating of its product.

ELECTRIC furnace installations in Holt caterpillar plants are offered by the author to show the flexibility and automaticity of control obtained and the practicability of locating at proper spots between machining operations

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Spectrographic Analysis Valuable in the Steel Plant

ON account of speed of manipulation and reliability of results, quantitative analysis by means of the arc spectrograph should recommend itself highly to the steelmaker. Its operation is described by Kellermann in *Stahl und Eisen*, Oct. 17, 1929.

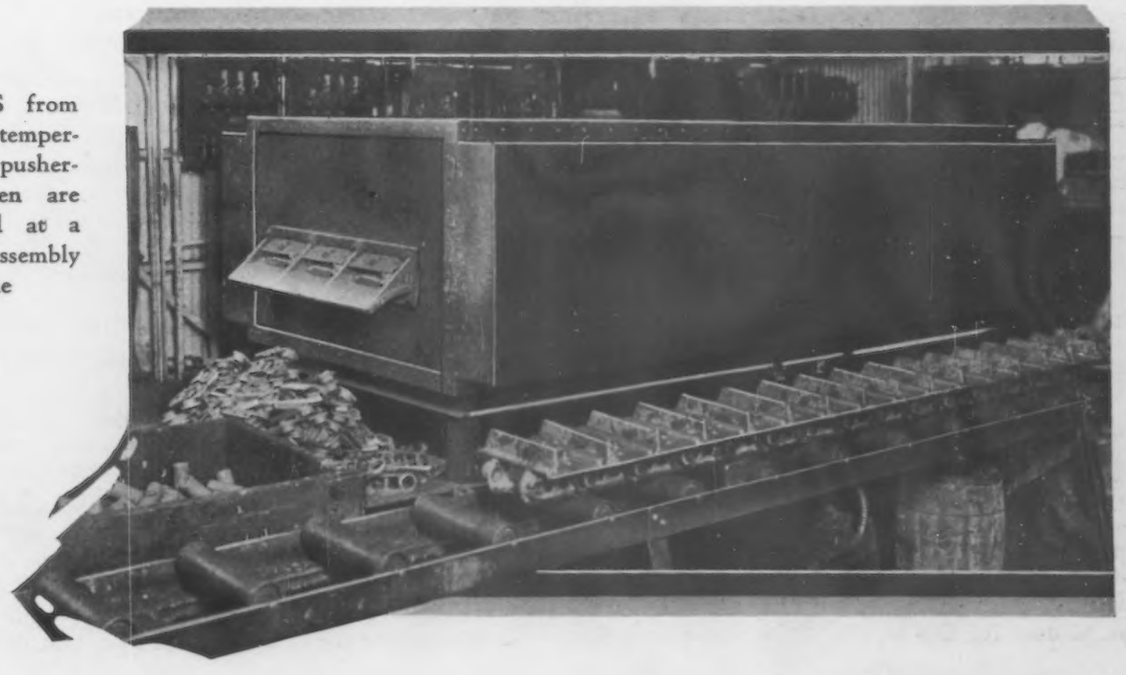
Determination of the amount of some element present in a base material, such as iron, depends on the fact that when an arc is struck between electrodes composed of the material to be analyzed, certain characteristic lines are produced when the light from the arc is broken down by a spectrograph. In addition to a number of lines due to the iron, there will also be lines present due to any other elements contained in the iron. Regardless of the amount present, the lines always occupy definite positions, so that it is possible to select those belonging to each element. Determination of the actual percentages is done by comparing the intensities of the lines in question with those produced by known standards.

The electrodes are usually made up in the form of drawn wires (0.06 in. dia.). It is possible, however, to use a sample in solution, simply by wetting pure carbon or graphite with the solution and pressing the damp mass into a pellet, which serves as an electrode.

Approximately ½ kw. is consumed by the arc at about 10,000 volts. Since the energy is proportional to the intensity of the lines on the photographic plate, it is apparent that fluctuations must be avoided. Since this is particularly difficult to accomplish, a number of ingenious means have been devised, whereby the comparison is made on a single plate, and is therefore independent of the energy. In one of these, solutions are used, as described above, to which a definite amount of some foreign element has been added. The intensity of the lines of this element is then compared with that of the element whose percentage is desired. In another method, the various lines due to iron itself are the standard of comparison.

The time of exposure varies from 10 to 60 sec., and the complete determination, including preparation of electrode and developing the plate occupies about 20 min.

Amounts as little as a thousandth part of 1 per cent may be detected by the spectrograph. As a consequence of this extreme sensitivity, its usefulness is limited to concentrations of 1 per cent or less. Its chief field at present seems to be in the rapid and accurate determination of small amounts of alloying materials.



PARTS from this temper-drawing pusher-type oven are delivered at a plant assembly line

Constant-Speed Motor Drive for Landis Bolt Threader

THE triple-spindle high-production bolt threading unit built by the Landis Machine Co., Waynesboro, Pa., and marketed as the Landis bolt factory threader, has been redesigned to include a constant-speed motor drive and a pick-off gear box.

The Gear Box on This Triple-Spindle High-Production Bolt Threader Permits Selection of Speed Most Suitable for the Work

The gearbox permits selection of the most efficient threading speed for any particular job. Fifteen threading speeds, from 38 to 271 r.p.m., are available using eight sets of interchangeable gears, and other speeds are obtained by means of other gears. All shafts in the gear box are made of alloy steel and are mounted on anti-friction bearings. All bearings are lubricated by the Alemite system. Drive from motor to gear box is by silent chain.

A low-speed low-pressure large-volume pump which is driven by belt from a constant-speed shaft floods the chasers and work with coolant. The entire coolant system has been redesigned to give larger volume at all cutting speeds. The machine is made in 1 and 1½-in. models.

New Hob for High Production

INVESTIGATION showed that the tips of hob teeth were doing the greater share of the work of removing metal. It was evident that the tips of the teeth could be strengthened if they could be widened. This result was accomplished by Barber-Colman Co., Rockford, Ill., by assuming a pitch diameter, for the gear to be cut, smaller than the actual pitch diameter, and laying out the profile of the hob tooth on the basis of this assumed diameter.

This made the pressure angle of the hob smaller than the pressure angle of the generated gear, gave wider tips to the hob teeth, and made them narrower at the base, without disturbing the outline of the generated gear teeth. Thus, a deliberate distortion allowed more metal at the point of greatest cutting effort, without affecting the results.

Another variation from common practice produced freer cutting action. Equal side clearances on the teeth often produce a dragging effect on the leaving side. A special attachment on the backing-off machines at the Barber-Colman plant compensates for this effect by making the clearances unequal. Thus, the leading side has less clearance and the leaving side more than customary, producing a more uniform cutting action on both leading and leaving sides.

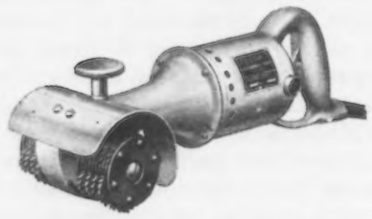
To increase the smoothness of cutting action still further, two more unorthodox changes were made. First, straight gashes are used, producing teeth having faces at an angle with the line of the lead helix, thus giving a shearing effect on the leading edge and top of each tooth. The added clearance mentioned above improves the cutting action of the obtuse-angled leaving edge.

Second, the teeth are sharpened with a considerable hook instead of the customary radial face. These distortions have the same effect in a hob that a drop-off back of the cutting edge has on any metal-cutting tool—they produce a more effortless cutting action, resulting in better finish on the work, it is stated.

Method for Cleaning Steel

A TOOL introducing a new method for removing paint, rust and scale from steel surfaces has been announced by the Concrete Surfacing Machinery Co., Cincinnati. It is the "Berg" cleaning tool, displacing the old, tedious method of wire brushing and scraping.

With this machine, one man can quickly cover large areas and produce a bright, clean, smooth finish



for the adhesion of new paint, it is stated. The makers claim it is invaluable for cleaning bridges, viaducts and other steel structures, boilers, coal bunkers, tanks, gas holders, barges, decks, dry-docks, stacks, steel cars, ships, ash hoppers, vats, gondola cars, trucks, etc.

The tool is light—weighs only 8 lb.—portable, and is easily operated. It is made in two models—electric and pneumatic. A General Electric universal motor, for either 110 or 220 volts, is used on the electric model.

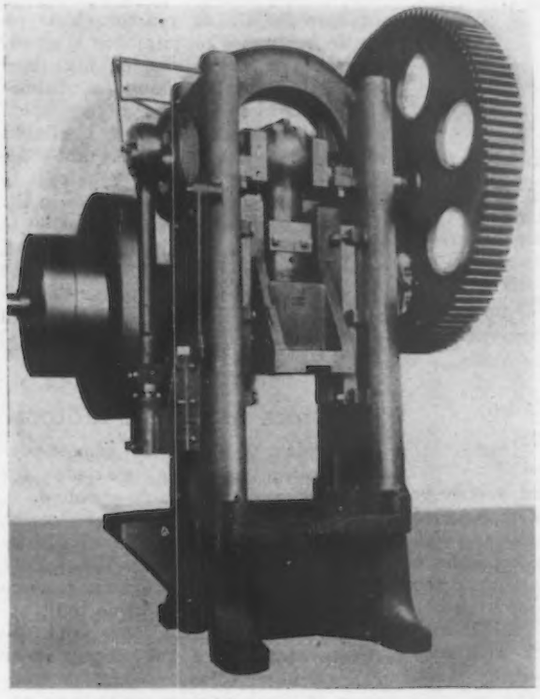
Cutler-Hammer Acquires Reynolite Products

On Aug. 1, the Reynolite division of Reynolds Spring Co., Jackson, Mich., became the wholly-owned subsidiary of Cutler-Hammer, Inc., Milwaukee. This brought into the Cutler-Hammer line the Reynolite products, bakelite flush plates, plural plugs, etc. It is said that the Reynolite name marked the first flush plates molded of bakelite and today marks the most complete line of such plates in the world.

Straight-Sided Power Press with Side Shear

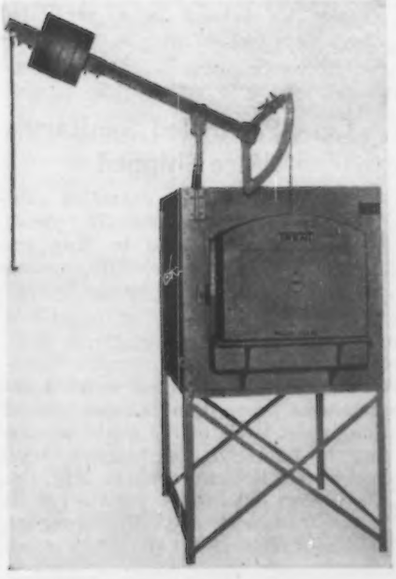
IN the straight-sided power press recently added to the line of the Zeh & Hahnemann Co., Newark, N. J., the large driving gear is located close to the frame so that no outboard bearing is required. This gives free access to the jaw clutch, which may be inspected or dismantled without interfering with any other parts.

This press, designated the No. 9-16, is of built-up tie rod construction and has a side shear attachment. The distance between uprights is 30 in. Although rated as exerting normal pressure of 250 tons, the machine is tested at 375 tons before shipment. With single back gearing, as shown, it weighs 37,000 lb., and makes 30 strokes per min. The standard stroke is 6 in. Features include centralized lubrication; back gear shaft mounted in roller bearings; and arrangement to permit brake adjustments from the operating position.



THE Back Gear Shaft Is Mounted in Roller Bearings and Lubrication Is Centralized

Quick-Locking Furnace Door to Save Current



ANY heat leakage around an electric furnace not only prevents it from reaching highest temperature, but also is wasteful of current. Harold E. Trent Co., Philadelphia, maker of the direct-heat type pictured here, claims stopping one of the heaviest losses by means of a quick-locking door-closer. When the counterweight rod is released, the door settles easily into place by gravity.

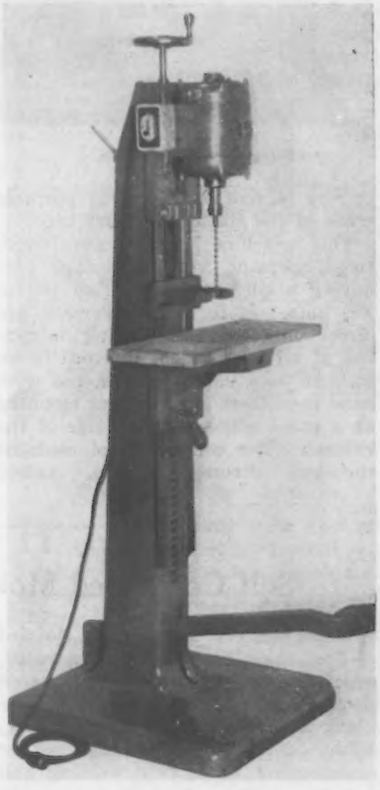
Fastened to the furnace front by loose-fitting bolts, permitting a rocker action, are the one-piece locking members, one on each side. Wedge-shaped projections on the door casting engage the bottoms of the locking members. In so doing they jam the upper ends of the latter against the top corners of the door, resulting in a good, tight joint between door and furnace front.

Another interesting feature is the new, continuously folded and formed type of ribbon heating element, with no sharp corners.

Furnace size 15 in. wide, 12 in. high and 24 in. deep, drawing 12 kw. at 440 volts, single-phase, produces 2000 deg. Fahr. on continuous service, handling from 150 to 175 lb. of steel an hour. Other sizes using from 12 to 21 kw. may be had, for any of the usual current supplies.

Wood Borer Equipped with Motor in the Head

THE Oliver Machinery Co., Grand Rapids, Mich., has brought out a new portable motor-in-head single-spindle vertical borer that will bore a ¾-in. hole in hard wood and a 1½-in. hole in soft wood to a depth of 4 in. With the table in use, it will bore holes in the edge of boards 22-in. wide; without the table, boards up to 36 in. wide can be accommodated. The machine will bore to the center of pieces 8 in. thick.



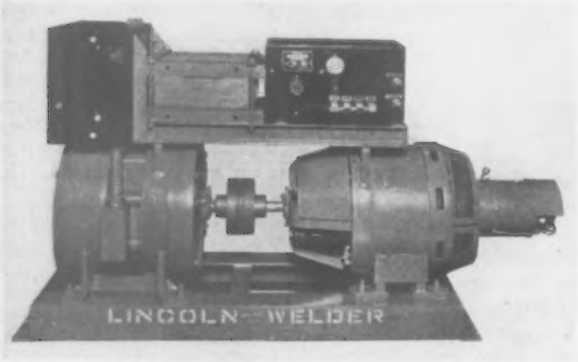
Holes Up to ¾-In. in Diameter May Be Bored in Hard Wood and Holes Up to 1½-In. in Soft Woods. The machine takes current from a light socket and is portable

This borer, designated as the No. 194B, is fitted with a plain wooden top table having vertical adjustment of 22 in.; one ½-in. boring bit; and a ½ hp. vertical ball-bearing motor. It will operate from light socket. The hold-down is mounted on a saddle which runs on ways on the column and may be adjusted quickly. The treadle, spring and pull-rod are arranged so that the maximum fulcrum power is obtained, facilitating treadle operation.

The machine occupies floor space of 24 x 28 in. and may be moved conveniently to various locations.

Welder with 600-Amp. Rating for Electrodes

A NEW welder with a rating of 600 amp. has been developed by the Lincoln Electric Co., Cleveland, to meet the demand for higher welding current employed with large size metallic and carbon electrodes. This welder is also used to supply current for the "Electronic Tornado," an automatic carbon arc-welding process.



THE Current Range of This Welder Is from 180 to 750 Amp. Both portable and stationary truck types are made

It may be had in either the portable truck or the stationary truck type.

This machine is a motor-driven, single-operator, variable-voltage unit having a current range from 180 to 750 amp. Motor and generator are direct connected. The working mechanism of all controls is contained in an inclosed ventilated steel cabinet with hand regulators and switches mounted on a panel which forms a side of the cabinet. The control panel contains rheostat, diverter switch, safety starter switch, volt-ammeter and wing nut terminals for cables. This unified control greatly simplifies operation of the welder. The control cabinet, in being mounted directly over the motor generator, is convenient for the operator; it also permits the removal of the motor generator armature without disturbing any other parts. Use of a combined voltmeter and ammeter permits the reading of voltage and amperage on the one dial. The face of this volt-ammeter is flush with the control panel, assuring the maximum protection. Equipping the terminals for the lead cables with winged nuts makes quick and easy connections possible, especially when it is desired to reverse the polarity of welding current. These terminals also eliminate the necessity of a switch for reversing polarity.

Engine and generator are connected by a 3-in. endless belt. The generator is thrown in and released by a hand-controlled belt tightener, which is a ball-bearing idler mounted on sliding ways, located on the driver's platform. Automatic stabilizing of the welding arc is provided for by a self-adjusting arc stabilizing reactor. This reactor facilitates maintaining a steady arc on low as well as on high currents, under all welding conditions.

For striking the arc a high open-circuit voltage of 65 volts is available, after which the voltage is automatically reduced to that required to maintain the arc. Adjustments in the range of welding current, from 60 to 250 amp., are made simply by shifting the generator brushes by means of an external handle. Further adjustment down to 25 amp. is made by an easy shift of electrode leads.

Self-Contained Mobile Arc Welding Unit

TIME and cost savings are claimed for the Trucwelder illustrated, which is a self-contained gas-powered electric arc welding unit built by the Clark Tructractor Co., Battle Creek, Mich., for machinery and other maintenance work, field welding and for many types of production work. In being mobile, it takes the welding equipment to the work, and has a major usefulness where there is no convenient electric current supply.

The unit is equipped with self-starter and headlights, carries all necessary welding accessories, has ample room for acetylene tanks, for cutting, seating room for crew and ample power for towing trailers.

Arc welding current, ranging from 60 to 250 amp. at 24 volts, is developed by a self-excited General Electric arc welding generator with control, driven by a special heavy duty, four-cylinder gas engine that develops 20 hp. at 1480 r.p.m. Currents between 25 and 60 amp. may be obtained by inserting in the circuit a resistor provided for the purpose. Current available is ample for use with all commercial sizes of metallic electrodes from 1/16 to 3/16 in., also for light carbon welding and cutting.

IN Addition to Carrying All Necessary Welding Equipment, the Trucwelder Has Room for Acetylene Tanks and Seating Room for the Crew. There is ample power for towing trailers

Starters for D. C. Motors

A COMPLETE line of remote-controlled magnetic starters for constant and adjustable-speed d. c. motors in sizes up to 10 hp., 230 volts, has been introduced by the Westinghouse Electric & Mfg. Co., East Pittsburgh. These starters provide three points of definite time limit acceleration, permitting safe and accurate starting of the motor under full or partial load. Four combinations of these starters make them applicable to a wide range of use in industrial and building applications.

All the time starters are of standardized construction, the different combinations being made possible by addition of certain parts to a standard chassis. The chassis consists of a three-point accelerating contactor mechanically connected to an ingenious escapement mechanism. These are mounted as a unit on a tough, molded insulating base. Bobbin-type resistors, mounted on the rear of this unit, provide the necessary resistance between points of acceleration. The chassis is inclosed in a ventilated sheet steel cabinet and is readily removable.

Less Enameled Sanitary Ware Shipped

June shipments of enameled sanitary ware totaled 203,478 pieces, against 241,897 pieces in May and 336,058 pieces in June, 1929, according to reports received by the Department of Commerce.

The English system of weights and measures prevails in 48.2 per cent of the export trade of the world, according to Luther D. Burlingame, legal technician, Brown & Sharpe Mfg. Co., Providence, R. I. The metric system is credited with only 37.5 per cent, leaving 14.3 per cent for other standards.

Automobile Industry Recuperating But Recovery May Be Slow

DETROIT, AUG. 4

THE automobile industry is entering August feeling much like a person who is in the first stages of recuperation following a severe illness. July brought a decline to a very low level and present estimates still put August only slightly, if any, better than the past month. The August showing will depend to a considerable extent upon what the Ford Motor Co. does.

After a three weeks' standstill, Ford is getting into production again today. The Ford machinery is so gigantic that the company cannot go from a complete shutdown to 7000 cars in a few hours. It is understood that it intends to get back into its former stride just as quickly as possible. This may mean only a few days, a week or perhaps longer. So far as the Ford schedule is concerned, the aim is to turn out approximately 7000 to 7500 cars a day on a five-day week.

Chevrolet's August program is said to be close to its July production of about 55,000 cars. However, the Ford and Chevrolet activities are shrouded in mystery and the opinion prevails here that both companies are likely to change their schedules as the month progresses to conform to current demand. Although it is too early to judge the reception of the new Buick eight, the fact remains that the Buick plant at Flint, Mich., is one of the few spots in this territory which is really active. The bulk of the burden of holding up production in August seems to fall on Ford, Chevrolet, Buick and Studebaker. The Chrysler organization also is reported to be doing fairly well. Hudson-Essex is in a slump, with output at a discouragingly low figure. The same unsatisfactory condition is reported to exist at Pontiac-Oakland, Oldsmobile-Viking, Durant and Reo.

* * *

What Is the Outlook?

TO most people who are selling material to the automobile industry and therefore are in close touch with the situation, there is a noticeable lack of enthusiasm in talking about the prospects for the remainder of the year. With industry in general marking time and the public seeing unemployment on all sides and therefore in the mood to save rather than spend, these vendors frankly confess that they don't see how retail sales can be heavy. To give further strength to their contention they point to the record in past years when retail demand and manufacturing operations in the last half have been far below the level maintained during the first six months.

WHAT is the outlook for the automobile industry for the remainder of the year? Recovery from the low point of July will begin this month, but the extent of the improvement is still shrouded with uncertainty as to how good the retail market may be.

* * *

NEW developments include introduction of the Buick eight, appearance on the streets of the Austin car, announcement that Cadillac will bring out a 12-cylinder model, changes in the Chevrolet design and resumption of manufacturing by the Ford Motor Co.

Some observers argue that the automobile companies could help themselves by pointing their production upward whether the immediate outlook warrants such a course or not. By so doing they would give employment to thousands of men who now are idle and would start the industrial machine on its way toward normal conditions again. However, this would be directly contrary to the practice to which they have adhered throughout 1930 of gaging operations to fit actual retail demand. Through the adoption of this policy they feel that they have put the industry in the healthiest situation in several years, with stocks in dealers' hands at a low point. Any improvement in business, therefore, is almost immediately reflected in increased operations.

The resumption by Ford has a far-reaching effect and is the most encouraging news of the week. It means that all of the factories supplying Ford with parts are able to get into production again and thereby provide work for thousands of employees. This, of course, is in addition to the thousands of families who are directly dependent upon Ford for their living.

* * *

Foundry Operations Low

Foundries in southern Michigan are not running more than 30 per cent of capacity. A few busy ones, like Chevrolet and Buick, are keeping the average up that high. Many plants are limping along, just barely avoiding a complete shutdown. One of the largest foundries, which a year ago was melting from 400 to 500 tons a day, has been melting less than 100 tons every other day.

* * *

The Austin Car Appears

HOW much competition the new American Austin car will give Ford and the other low-priced automobiles is a matter of speculation in Detroit. Some people are inclined to dismiss the newcomer by dubbing it a fad and putting it in the novelty class. In a city of comparatively great distances between points, such as Detroit, it is believed that the driving public will prefer the larger, heavier cars which can be run swiftly without danger. Perhaps in municipalities with narrow streets and much congestion, the Austin, with its ability to park in a small space and turn around within narrow confines, will prove popular. The general belief is that this bantam will draw sales from youngsters of high school and college age who are supplied with their own means of transportation by indulgent parents. It has even been suggested that it will offer stiff competition to motorcycles, particularly for delivery service. There is no doubt about the fact that the Austin has captured the interest of the public, for wherever one is parked it is surrounded by peo-

ple who are examining it and talking over its possibilites.

It is hard to realize how light this car is. A few days ago an Austin was put on display on the mezzanine floor of a hotel in a nearby city. Four men of average size and strength carried it from the lobby up the steps to the mezzanine. It is interesting to note that Austin bodies are made in Grand Rapids, Mich., and are transported from there to Butler, Pa., to be assembled at the Austin plant. This is an unusually long haul, but apparently the cost is not high or the arrangement would not be feasible. One report, generally discredited but nevertheless going the rounds, is that Chevrolet contemplates bringing out a small model to compete directly with the Austin. While this car and its future demand are being dissected by the critics, the plant at Butler is said to be turning out about 150 jobs a day and unfilled orders have accumulated in large volume. Naturally, a considerable portion of the activity is due directly to the necessity of supplying dealers with cars for display and demonstration purposes.

* * *

Cadillac Enters 12-Cylinder Field

FORMAL announcement that the Cadillac will bring out a 12-cylinder car has not elicited surprise locally. The influx of eight-cylinder cars into the medium-priced field, and finally Buick's abandonment of the six in favor of the eight, makes it increasingly difficult for Cadillac to sell its eights. As one Cadillac owner puts it, "I am thinking about buying a new car. What has Cadillac to offer in its eight-cylinder line to justify asking almost double what Buick is getting for its new models?" Some reports have it that Cadillac may not get entirely away from the eight, but lower its price as a bait for business. However, the logic of the situation seems to favor the displacement of the eight by the 12-cylinder car. This would leave the LaSalle as the sole representatitve of the Cadillac division of General Motors in the eight-cylinder group.

* * *

About the New Chevrolet

There has been much talk about the new Chevrolet, especially in regard to radical changes which may be made. One fantastic idea is that the front-wheel drive may be incorporated in the 1931 model. Those who are familiar with the automobile trade are of the opinion that aside from the use of wire instead of disk wheels, the Chevrolet will not differ materially in design from the present car. They base their assertion on the fact that Chevrolet is getting more and more to make a good substantial automobile which is a standard product, much like the Ford, and that in order to maintain sales at a fairly satisfactory level it is not necessary to embody revolutionary changes.

In Chevrolet's shift from disk to wire wheels, strip steel makers stand to lose a sizable amount of business. Practically all of the material for the disk wheels has been supplied by the strip mills, which now are looking about to try to find new uses for their product.

* * *

Will Radio Sets Be Standard Equipment?

A RAPIDLY growing group of radio manufacturers are taking up the production of radio sets designed especially for installation on automobiles. Activities along this line already have gone so far that a radio set as part of a car's equipment cannot be dismissed as a mere novelty. At least some automobile companies have come to the conclusion that this is not the case. One maker in the upper medium price level, and perhaps others, has a radio antennae in the top of all of its models and wires running down to a point underneath the dashboard. All the car owner has to do is to put in a radio set and hook it up. The set is so conveniently located that the driver can tune in on a program by reaching over with his right hand under the dashboard and turning the dial.

One automobile engineer suggests that a radio set so installed provides great enjoyment to business men, particularly salesmen, who drive long distances the year round. When making long jumps between cities, they can listen in on a popular or symphony orchestra or a talk and thereby relieve the monotony of steady driving. This same engineer believes that perhaps two years hence all automobiles selling for $2,000 or more will have radios as standard equipment. At present, however, automobile companies are hesitant about placing radios in the class of standard furnishings which go with a car when it is purchased, preferring to make it easy for the owner to buy a radio set as an accessory and install it on his car.

Welded Factory for Welding Work

Structure of 250 Tons Erected in Oklahoma for Building Tanks, Vats, Drums, Stacks and Many Other Products

A NEW factory for the American Tank & Equipment Corporation, Oklahoma City, Okla., has been completed—of all-welded construction. Three rows of columns support the structure. This factory is said to be the biggest shop of its kind west of Chicago, and is one of a very few, and one of the largest welded buildings in the country.

Plant Erected in Six Weeks

The plant is fireproof. It was built in six weeks—half of which time was taken in welding the framework, 250 tons of steel having been used. Fabrication of the spans was done in the Kansas City plant of Black, Sivalls & Bryson Mfg. Co. Here the steel was welded together and the framework was shipped to Oklahoma City for erection. The large units were welded into place during the field construction of the major framework.

Adjoining the factory building is being erected one of the largest heat-treating furnaces in the country—80 ft. long, 13 ft. wide, and 18 ft. high. This will be used to anneal or otherwise heat treat heavy vessels after they have been welded, to equalize stresses and assure full strength of the metal.

Straight-Line Production Planned

Production in this plant will be on a continuous line, on the principle of automobile factories. A railroad track at one end of the building will serve for three cars. In the first bay, material will be unloaded and passed on down the line from stock to finished product. Steel will be stacked on end to save space, first stocked, then passed to the layout floor, then to the machinery for cutting, squaring, rolling, shaping and punching, passing down one bay of the building to the other.

In the second bay the products will be assembled, welded, finished, heat treated, tested, painted and shipped. In the center of the front end will be a toolroom, above which will be the foreman's office and observation rooms to watch production.

Special equipment and devices have been introduced to bring about efficiency in operation, and machine production as against man handling. Special vertical doors were constructed, of the guillotine type, like a theater curtain. There are three of these "team" doors—two for trucks, and one for freight cars. The heavy doors are easily operated by means of chains and weights. The roof will carry a sign designating the nearby airport.

Products made here will consist of many articles now manufactured at the old plant of the American Tank Co., as the company formerly was known. They include improved American patented oil and gas separator, welded oil-field tanks, welded bulk storage and filling station tanks, welded refinery equipment, welded piping, building caissons, bridge piers, packing house vats, condenser boxes, pressure drums, smokestacks, and numerous other welded products for many industries.

First Imports Under New Tariff

Thirteen-Day Movement at Lower Daily Rate—Six-Month Decline 24 Per Cent

WASHINGTON, July 31. — Imports of iron and steel products into the United States from June 18, when the Hawley-Smoot tariff act went into effect, through the remainder of that month, totaled 19,636 gross tons. From June 1 to June 17 imports were 29,319 tons, as stated in THE IRON AGE of July 31, page 307. The total for the entire month therefore was 48,955 tons.

In preparing figures for June 18-30, the Iron and Steel Division, Department of Commerce, has made a new classification. This has been done by dividing some of the previous items into those which have been mentioned specifically for the first time in the new tariff law, and by adding entirely new listings, not previously included. The result has been to increase the tonnage.

To make the new table comparable so far as possible with previous totals, the new listings have been taken into account for previous periods. The addition of the new items brought the total imports for the six months ended June 30, 1929, to 369,252 tons, against the former total under the old classification of 358,198 tons. The total for the first six months of 1930 was 280,822 tons, showing a decline of 24 per cent.

In the new tables separate listings have been made of sponge iron, other ferroalloys, concrete reinforcement bars, hollow bar and drill steel and sheet piling, while rolled pipe has been divided and listed as welded pipe and other pipe.

All these items, except ferroalloys, however, were included in the previous table, but under broader classifications. Actually new items, other than ferroalloys, include spiegeleisen, included with ferromanganese, and horse and mule shoes. The addition of spiegeleisen represents the principal change in the six months totals.

On the basis indicated, imports during the first 17 days of June were received at the rate of 1725 tons daily, while over the remaining 13 days this rate dropped to 1510 tons, giving an average rate of 1632 tons for the month.

The largest item of importation during the 13-day period was structural shapes, Belgium supplying 4822 tons of the total of 5705 tons. Ferromanganese and spiegeleisen imports were 5222 tons, of which Canada supplied 2867 tons, the United Kingdom, 1720 tons, and Germany, 600 tons.

Imports of iron ore during the 13-day period were 117,790 tons. Chile supplied 75,792 tons; Sweden, 11,895 tons; Newfoundland and Labrador, 9676 tons; French Africa, 6890 tons; Soviet Russia, 6756 tons, and Australia, 6781 tons.

Under the new tariff law ore containing 10 per cent or more of manganese is classified as manganese ore, while under the Fordney-McCumber act it was not so classified unless it contained 30 per cent or more of manganese. Accordingly, in the future there will be a relative increase in manganese imports and a relative decrease in iron ore imports. However, in the 13-day period there were no receipts of manganese ore containing between 10 and 35 per cent manganese.

Receipts of ore containing more than 35 per cent manganese totaled 15,179 tons. Of this amount, 8475 tons came from Soviet Russia, 4002 tons from Brazil, 1804 tons from India and 898 tons from Canada.

Imports of Iron and Steel Products into the United States

(In Gross Tons)

From	June 18-30	June, Total
Austria	11	56
Belgium	6,925	12,091
Czechoslovakia	18	31
France	1,424	5,828
Germany	2,593	10,043
Italy	25	127
Jugoslavia and Albania	....	22
Netherlands	61	206
Norway	440	1,542
Poland and Danzig	....	485
Sweden	903	2,593
Switzerland	....	57
United Kingdom	2,002	3,475
Canada	4,478	7,577
British India	755	4,637
Japan	1	2
Hong Kong	....	1
Miscellaneous	....	182
Total	19,636	48,955

Imports of Iron and Steel Products into the United States

(In Gross Tons)

Item	June 18-30, 1930	June 1-17, 1930	May, 1930	January Through June 1930	January Through June 1929
Pig iron	1,547	5,242	13,891	61,478	73,461
Sponge iron	5				
Ferromanganese and spiegeleisen*	5,222	2,374	4,781	30,649	43,627
Ferrochrome†	....	57	....	144	240
Ferrosilicon‡	367	465	742	3,615	4,137
Scrap	1,061	1,607	1,749	13,386	43,273
Pig iron, ferroalloys and scrap	*8,202*	*9,745*	*21,163*	*109,272*	*164,738*
Steel ingots, blooms, billets, etc	648	809	1,117	8,277	12,383
Wire rods	181	774	490	5,697	8,596
Semi-finished steel	*829*	*1,583*	*1,607*	*13,974*	*20,979*
Concrete reinforcement bars	38				
Hollow bar and drill steel	32	987	3,101	17,419	18,272
Merchant steel bars	1,362				
Iron slabs	85				
Iron bars	10	42	62	728	1,983
Boiler and other plate	....	407	....	1,736	2,422
Sheets, skelp and saw plate	792	2,763	1,558	15,204	10,430
Tin plate	10	28	11	85	142
Structural shapes	5,705				
Sheet piling	....	7,791	19,640	82,007	69,173
Rails and rail fastenings	63	103	467	2,416	3,060
Welded pipe	277				
Other pipe	128	1,916	1,587	11,421	22,056
Barbed wire	96	272	283	2,345	2,965
Round iron and steel wire	106	322	829	2,845	3,266
Telegraph and telephone wire	....	1	1	19	....
Flat wire and strip steel	21	75	110	740	1,103
Wire rope and strand	132	208	248	1,444	1,264
Other wire	9	25	5	189	349
Hoops and bands	906	666	2,098	9,318	14,763
Nails, tacks and staples	263	453	229	2,317	4,744
Bolts, nuts and rivets	2	21	59	235	136
Horse and mule shoes	....	7	1	8	11
Rolled and finished steel	*10,037*	*16,037*	*30,289*	*150,476*	*156,139*
Cast iron pipe and fittings	509	1,804	342	6,158	26,274
Castings and forgings	59	100	164	942	1,122
Total	19,636	29,319	53,565	280,822	369,252

*Manganese content.
†Chromium content.
‡Silicon content.

Scrap Freight Rates From Southwest Reduced

WASHINGTON, Aug. 5.—Reductions in rates on iron and steel scrap from the Southwest to consuming markets were ordered by the Interstate Commerce Commission in a report made public last week. Effective Oct. 10, the new rates will be 15 per cent of the Consolidated Southwestern first-class rates, minimum 50,000 lb., and 12½ per cent, minimum 75,000 lb. The previously prescribed rates were 17½ per cent, minimum 50,000 lb., and 13½ per cent, minimum 70,000 lb.

The decision was handed down in what is known as the case of the Waste Material Dealers' Association of Arkansas. The scrap dealers asked for a reopening of the Consolidated Southwestern cases with a view to getting lower rates on scrap which, it was contended, could not move freely from the Southwest under existing rates. They were supported by practically 90 per cent of the scrap trade of the country, including the Institute of Iron and Steel Scrap and other organizations. The issues involved were stated in THE IRON AGE of June 19, page 1834.

Mechanical Refrigeration to the Front

Sharp Rise in Domestic Application Matched by Growth in Industrial Uses

MANUFACTURED weather by the use of machinery appears to be the answer to Mark Twain's observation that people complain about the weather but do nothing about it.

The business brought to the metal-working, steel and related industries from this conquest of heat has not been stated in dollars and cents but its growth was strikingly cited by Assistant Secretary of Commerce Julius Klein in a recent radio talk on "The New Business of Refrigeration." The business represents an enormous sum. The ingenuity and widespread application of devices for refrigeration in industry, in the field of amusement, in making cool drinks, etc., was interestingly pictured by Dr. Klein. He said that it is estimated that the application of temperature-and-humidity control in American industries now results in savings in excess of $15,000,000 a year. In a knitting mill, it was stated, the cost of air conditioning amounts to about ½c. per pair of hose produced. Not only is human comfort enhanced, Dr. Klein said, but business experience has proved that the capacity of the plant can be definitely increased because in controlling the moisture content of the air there is also control of the tendency of the fibers to curl and twist about. In a cotton mill the cost of such control was said to be less than ½c. per loom-hour.

Manufactured weather in a theater, it was stated, can be furnished at a cost of about 2c. per seat per performance and in restaurant or cafeteria at not over 2c. per meal. In large offices atmospheric conditions can be controlled, it was pointed out, at a cost of 1c. per man-hour.

After touching on the picturesque achievements of modern refrigeration in artificial skating rinks and in halls for playing hockey and for making cool drinks, Dr. Klein said that probably the commonest illustration of development in the refrigeration industry brought about by engineers is the household mechanical refrigerator. Machine manufacturers of this kind of equipment, it was declared, are required to manufacture with ever-increasing precision. The manufacturer of one of these sets reported that certain parts are kept within a tolerance of 0.0002 in., or about one twenty-sixth of the thickness of a piece of paper.

The first mechanical refrigerator was made as recently as 1914 and it required 10 years to sell 10,000 of these units. At the present time, Dr. Klein stated, 10,000 of them are absorbed by the American buying public in four days and 630,000 such sets were sold in 1929. Development of the "dry ice" industry also was discussed, as was the new application of refrigeration to "quick freezing."

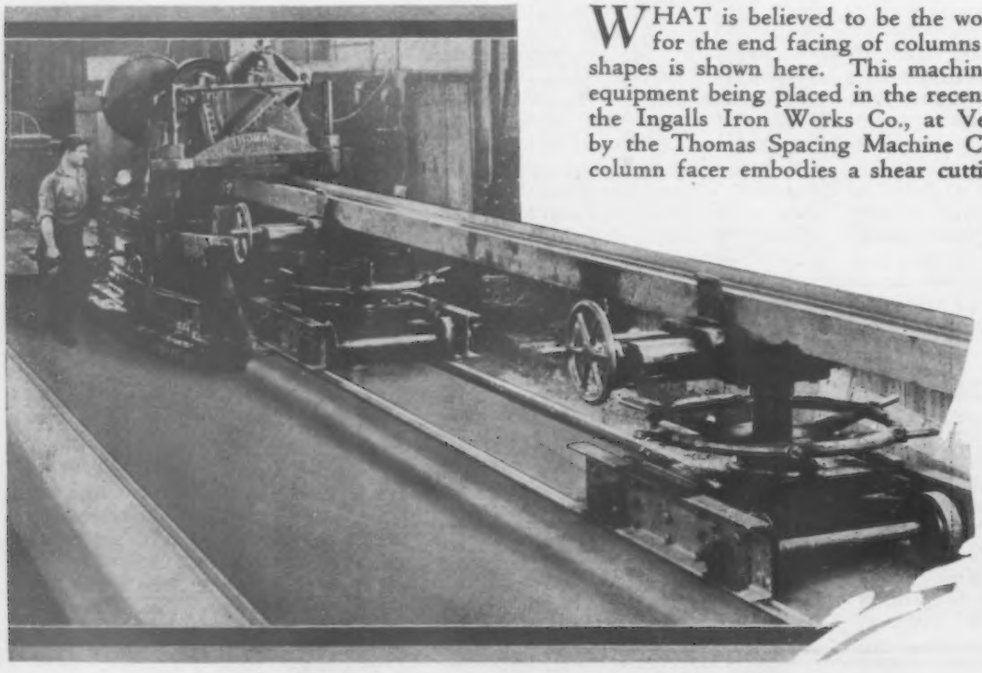
Dr. Klein said that there are no fewer than 220 industries that employ refrigeration today. The manufacture of lubricating oil, it was stated, requires the removal of natural paraffine and other waxes and this is accomplished most efficiently by refrigeration. Also, it was stated, the condensation of casing head gas by means of refrigeration had added materially to the supply of high-grade gasoline. One of the novel and important applications of refrigeration was said to be for freezing quicksand and water to enable tunnels and shafts to be sunk through such precarious soils in foundation work, in mines and other places. All of the larger manufacturers of fur garments, and many of the smaller ones, Dr. Klein explained, have their places equipped with refrigerating machinery to safeguard the furs from being attacked by moths. A refrigerating machine was said to be an absolute necessity for cooling the powder magazines on board warships, being a factor in the prevention of disasters.

Midland Company Acquires Air Brake Rights

Midland Steel Products Co. has acquired all rights under American and foreign patents covering air brakes for automobiles and air brakes and starters for airplanes and boosters, for all styles of brakes, from N. A. Christensen, inventor, it is announced by E. J. Kulas, president.

The company plans to start development and production of air brakes for airplanes, trucks, trailers and buses, and also to proceed with development of four-wheel air brakes for all classes of passenger automobiles. The new development is being undertaken in connection with the further development of the Midland Steeldraulic brake. Production will be at the Cleveland plant.

Large Column-Facing Machine



WHAT is believed to be the world's largest machine for the end facing of columns and other structural shapes is shown here. This machine, a unit of the new equipment being placed in the recently acquired plant of the Ingalls Iron Works Co., at Verona, Pa., was built by the Thomas Spacing Machine Co., Pittsburgh. This column facer embodies a shear cutting action, something not believed to have been accomplished in end milling. The blades are so placed on the cutter head that the load on the cutters is approximately 75 per cent less than with straight cutting action. This makes possible much greater speeds and feeds without danger of distortion.

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Machinery Exports Keep Up Volume

June Movement Falls Off, But Six-Month Total Makes New High Record—Imports Less

WASHINGTON, July 26.—Making a decline of nearly $7,000,000, exports of machinery from the United States in June were valued at $42,648,000, against $49,526,000 in May.

Exports for the six months ended in June of the current year totaled $313,464,000, an increase of $8,643,000 over those in the like period of last year and the highest ever recorded for any half-year. Previous to 1929 the top figure was $255,845,000, in the second half of 1928.

Exports of industrial machinery in June totaled $21,000,000, according to the classification of the Division of Statistics, Department of Commerce, showing a healthy business in foreign markets for this class of American machinery. Exports of power-driven metal-working machinery totaled 922 units, valued at $1,813,843, in June, compared with 1109, valued at $2,414,374, in May.

Exports of agricultural machinery in June dropped to $7,798,000 from $9,615,000 in May, but for the first half-year were $79,007,000, the largest record ever reached in such a period. In the corresponding period of last year the total was $72,068,000. The bulk of the shipments was made up of tractors, the total value in the first six months of 1930 being $49,852,449. Indications are that Russian shipments, which have declined, will continue to fall.

Imports of machinery and vehicles in June (up to June 17, when the tariff change came) were valued at $2,032,735, against $2,755,465 in May. In the first six months of 1930 they were $19,013.891 as against $21.859.545 in the corresponding period of last year. Imports classified in THE IRON AGE table were valued at $1,478,120 in June and $14,405,954 in the six months ended June, comparing with $16,414,371 in the 1929 period.

Imports of industrial, office and printing machinery in June, 1930, were valued at $1,165,047. In the first six months of 1930 they were valued at $9,506,686, against $12,487,534 in the same period last year.

LaSalle Steel Co., 844 Rush Street, Chicago, manufacturer of cold-finished bar steel, has appointed Pfaff & Bathke, Pioneer Building, St. Paul, Minn., as its representative in the Twin Cities district. It has appointed Milton Pray Co., with offices in Los Angeles, San Francisco and Seattle, as Pacific Coast sales representative.

Machinery Exports from the United States

(By Value in Thousands of Dollars)

	June		Six Months Ended June	
	1930	1929	1930	1929
Locomotives	$37	$157	$436	$932
Other steam engines	44	66	358	471
Boilers	55	152	911	918
Accessories and parts	225	169	528	503
Automobile engines	266	849	4,565	7,747
Other internal combustion engines	779	549	5,199	5,034
Accessories and parts	268	303	2,004	2,363
Electric locomotives	29	22	273	354
Other electric machinery and apparatus	954	894	5,472	6,680
Excavating machinery	1,095	567	5,933	4,143
Concrete mixers	73	95	595	710
Road-making machinery	314	393	2,355	1,821
Elevators and elevator machinery	470	461	3,179	2,578
Mining and quarrying machinery	1,451	1,384	9,387	8,363
Oil-well machinery	2,219	1,972	15,017	12,357
Pumps	665	940	5,122	6,125
Bending and power presses	400	441	2,600	1,839
Forging machines	155	198	1,187	773
Machine tools*	1,823	1,517	14,727	9,343
Other metal-working machinery and parts	518	724	3,656	3,904
Textile machinery	705	1,024	4,787	6,988
Sewing machines	613	843	4,271	5,186
Shoe machinery	125	124	931	1,060
Flour-mill and gristmill machinery	25	38	201	303
Sugar-mill machinery	676	343	1,611	1,471
Paper and pulp-mill machinery	362	370	1,598	1,608
Sawmill machinery	67	74	479	468
Other woodworking machinery	178	187	929	1,158
Refrigerating and ice-making machinery	203	208	1,849	2,081
Air compressors	509	590	3,529	3,840
Typewriters	1,232	2,032	10,062	12,209
Power laundry machinery	121	146	912	993
Typesetting machines	209	417	2,076	3,082
Printing presses	357	669	2,748	3,866
Agricultural machinery and implements	7,798	12,041	79,007	72,068
All other machinery and parts	17,628	18,882	114,970	111,482
Total	$42,648	$49,841	$313,464	$304,821

*Principal details in another table.

Imports of Machinery into the United States

	June		Six Months Ended June	
	(a) 1930	1929	(a) 1930	1929
Metal-working machine tools	$90,114	$130,271	$588,306	$619,960
Agricultural machinery and implements	301,756	794,779	6,981,421	5,442,860
Electrical machinery and apparatus	101,893	163,077	625,360	683,363
Other power-generating machinery	5,148	164,367	241,699	653,332
Other industrial machinery	651,612	888,678	4,559,886	6,366,592
Vehicles, except agricultural	327,597	468,089	1,409,282	2,638,264
Total	$1,478,120	$2,609,261	$14,405,954	$16,404,371

(a) Imports only through June 17, when Fordney-McCumber tariff act expired.

Exports of Power-Driven Metal-Working Machine Tools

	June, 1930		May, 1930	
	No.	Value	No.	Value
Engine lathes	103	$131,657	254	$616,374
Turret lathes	73	289,319	57	229,890
Other lathes	75	136,240	94	218,653
Vertical boring mills and chucking machines	19	94,968	8	20,641
Thread-cutting and automatic screw machines	55	73,903	75	94,310
Knee and column-type milling machines	40	111,998	21	78,689
Other milling machines	74	287,117	80	330,165
Gear-cutting machines	69	131,930	40	119,935
Vertical drilling machines	38	65,313	41	66,833
Radial drilling machines	23	61,668	12	15,145
Other drilling machines	83	73,657	90	126,654
Planers and shapers	27	92,385	49	107,311
External and cylindrical grinding machines	49	154,055	78	201,580
Internal grinding machines	12	32,550	28	108,422
Metal-working tool-sharpening machines	182	77,083	182	79,772
Total	922	$1,813,843	1,109	$2,414,374

Where Steel Exports Went in First Half-Year

Canada Took 227,271 Tons of Nine Leading Items—Japan Retains Second Position with 54,923 Tons, Followed by Chile, 24,084 Tons; Argentina, 18,859 Tons; Philippines, 17,532 Tons; Mexico, 17,263 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	June		Six Months Ended June		June		Six Months Ended June		June		Six Months Ended June	
	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929
Totals	*6,276*	*17,640*	*61,636*	*107,296*	*7,617*	*11,374*	*56,017*	*83,896*	*6,862*	*16,948*	*67,724*	*95,326*
Canada	4,456	14,791	49,282	90,584	1,255	3,534	13,183	18,900	4,386	9,231	40,145	52,879
Japan	....	271	994	1,692	306	312	1,611	1,365	229	3,067	6,254	13,107
Cuba	136	104	1,078	829	296	617	2,359	2,907	13	78	445	761
Philippine Islands	135	77	471	882	1,628	1,182	11,297	13,865	607	5	2,483	2,419
Mexico	218	54	798	343	520	1,355	2,495	6,719	140	331	1,377	1,815
Argentina	....	....	....	....	88	785	1,057	3,435	68	629	1,704	3,208
Chile	....	....	....	....	....	....	820	....	....	....	....	1,447
Colombia	....	....	....	....	173	19	1,422	3,238	196	26	359	148

	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	June		Six Months Ended June		June		Six Months Ended June		June		Six Months Ended June	
	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929
Totals	*7,750*	*5,215*	*54,633*	*82,392*	*4,790*	*6,395*	*22,632*	*35,688*	*1,877*	*3,789*	*15,583*	*26,127*
Canada	1,262	1,681	6,541	13,981	509	528	1,927	1,532	475	732	4,593	8,292
Japan	1,416	....	4,913	5,470	....	....	....	....	9	139	322	882
Cuba	230	150	2,795	5,429	359	620	1,764	1,443	102	143	605	605
Philippine Islands	533	151	2,457	4,206	92	486	618	3,296	37	74	206	351
Mexico	25	119	453	1,643	627	618	3,610	3,192	121	209	949	1,078
Argentina	551	489	1,079	1,755	282	620	2,497	3,955	338	909	4,064	4,844
Chile	1,864	265	15,297	12,196	....	....	....	....	....	....	....	....
Colombia	7	223	3,223	3,106	118	209	959	4,564	....	....	....	....
Brazil	....	795	1,830	4,350	1,857	1,267	4,351	6,631	82	280	433	909
China	....	373	45	4,151	....	....	....	....	....	....	....	....

	Tin Plate				Steel Bars				Plain Heavy Structural Material			
	June		Six Months Ended June		June		Six Months Ended June		June		Six Months Ended June	
	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929
Totals	*15,577*	*18,041*	*127,391*	*136,121*	*7,245*	*12,249*	*56,280*	*106,465*	*10,229*	*31,268*	*79,166*	*145,866*
Canada	4,482	3,892	20,169	23,765	3,396	7,460	27,219	58,553	9,013	26,966	64,212	125,313
Japan	4,259	4,345	35,563	34,960	51	281	1,585	18,602	575	2,359	3,681	4,926
Cuba	431	303	2,178	3,207	335	234	1,208	2,053	86	387	1,814	1,479
Mexico	782	668	6,445	4,583	95	194	723	710	64	50	413	299
Argentina	730	2,003	6,941	11,749	74	104	391	382	6	....	1,126	1,861
Chile	728	561	2,449	2,885	312	70	3,947	1,829	98	522	1,571	2,905
Brazil	153	224	1,635	2,430	43	31	475	1,765	....	....	....	....
China	1,407	2,211	15,099	11,446	....	....	....	....	....	....	....	....
British India	12	123	5,229	3,714	....	....	....	....	....	....	....	....
United Kingdom	....	....	....	....	1,591	2,058	5,201	10,386	....	....	....	....
Italy	1,250	584	6,482	3,884	....	....	....	....	....	....	....	....

Destination of Iron and Steel Exports

(In Gross Tons)

Country	June, 1930	May, 1930	June, 1929	January Through June 1930	January Through June 1929
North and Central America and West Indies	*75,622*	*102,791*	*139,454*	*584,008*	*813,822*
Canada and Newfoundland	60,416	87,162	117,056	475,072	675,614
Cuba	3,897	3,347	4,624	24,105	36,241
Guatemala	349	251	335	1,860	3,827
Honduras	618	358	736	3,849	6,727
Mexico	7,145	7,934	10,876	51,921	45,262
Panama	1,043	708	1,045	9,749	10,226
Salvador	109	255	234	1,150	4,213
British West Indies	1,334	1,543	1,662	7,955	12,385
Other West Indies	425	839	2,127	6,326	14,384
Other Central America	286	394	759	2,021	4,943
South America	*18,202*	*26,586*	*27,026*	*160,186*	*215,592*
Argentina	3,663	5,397	8,420	29,859	54,031
Brazil	3,971	3,054	4,681	23,180	33,516
Chile	5,466	4,651	2,879	42,351	31,841
Colombia	1,216	4,492	2,723	16,424	24,757
Peru	902	2,080	2,365	9,235	17,672
Uruguay	1,695	3,160	374	11,226	5,441
Venezuela	1,095	2,873	5,189	24,835	45,313
Other South America	194	879	395	3,076	3,021
Europe	*14,075*	*14,638*	*31,599*	*122,512*	*192,468*
France	446	206	1,564	4,589	9,853
Germany	71	104	766	4,288	12,720
Italy	2,807	2,652	10,495	41,647	64,437
Poland and Danzig	....	....	7,406	5,112	51,690
Soviet Russia in Europe	908	1,897	159	6,916	2,877
Spain	405	14	2,771	10,905	4,377
Sweden	237	607	322	2,523	1,785
United Kingdom	4,500	5,123	5,455	25,608	30,365
Other Europe	4,701	4,035	2,661	20,924	14,364
Far East	*50,122*	*49,681*	*46,981*	*346,671*	*358,324*
British Malaya	447	337	85	4,308	3,901
China	2,908	3,807	4,587	26,317	42,052
Netherlands East Indies	1,950	4,770	3,269	22,328	36,794
India and Ceylon	236	1,401	1,439	11,150	11,842
Hong Kong	129	217	302	2,879	3,409
Japan	36,909	27,801	27,558	219,334	186,787
Kwantung	87	2,615	609	6,347	7,871
Philippine Islands	6,488	3,780	5,078	37,423	47,051
Australia	483	1,080	2,593	6,131	11,446
New Zealand	268	278	226	2,263	2,794
Other Asia and Far East	217	3,595	1,235	8,191	4,377
Africa	*1,391*	*2,424*	*2,755*	*11,624*	*11,597*
Union of South Africa	513	364	1,029	2,789	4,193
Egypt	116	146	1,100	2,408	5,195
Mozambique	78	187	288	2,280	1,104
Other Africa	664	1,727	338	4,147	1,105
Totals	159,392	196,120	247,815	1,225,001	1,591,803

Spread Between Output and Demand Widens

BY LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

COMPLETE data for June indicate an increase in the maladjustment between steel production and consumers' requirements. Indexes of both declined more than is usual for the season, but the index of steel ingot production held up relatively higher than did the index of requirements. On the basis of this showing, it is safe to say that steel ingot production has to be curtailed considerably if a balance between supply and demand is to be restored.

Our index of potential requirements fell to the lowest point reached this year. Not since August, 1924, have the potential current requirements of the chief steel-consuming industries—the "composite demand line"—fallen so low.

The index of automobile production was at the rate of 101.9 per cent of the 1921-1927 average in June, against 114.3 per cent in May. Building contracts (floor space) fell below the previous low, and railroad tonnage fell to a new low for the current cycle. The index of mining and oil was 96.8 per cent, against 99.8 per cent; the increase in oil tending to offset the declines in coal production.

General miscellaneous manufacturing activity (excluding iron and steel and automobile production) was off about two points, while machine tool orders fell to another new low.

Our conclusion that either steel production must be further curtailed, or that activity in steel-consuming industries must rise, still holds. Because the maladjustment between the two is growing larger and the prospects are for a further drop in the "composite demand line" during July, the ultimate recovery in steel production appears to have been postponed.

Conditions in Specific Industries

Automobile production is being curtailed in drastic fashion. Several producers have shut down, and in at least one case the date for reopening has been postponed. Reports now indicate that August production will show little, if any, improvement over July. Retail buying of cars is at a low level and reflects the slump in consumer purchasing power. The sharp decrease in factory payrolls and the drastic decline in farm prices last month give no indication of maintaining current levels, let alone any sign of improvement. The best that can be said at present is that the inventory situation is being improved and that price cuts and new models may expedite recovery.

Railroad earnings again showed large declines in June. Gross was about 16 per cent lower than a year ago, and the decline in net was about 33 per cent. Railroad car orders declined, but unfilled orders for locomotives increased, as shipments were lower.

Building permits and contracts (floor space) indexes both declined—the latter falling to new lows for the current cycle, but contemplated construction was higher, after seasonal adjustment.

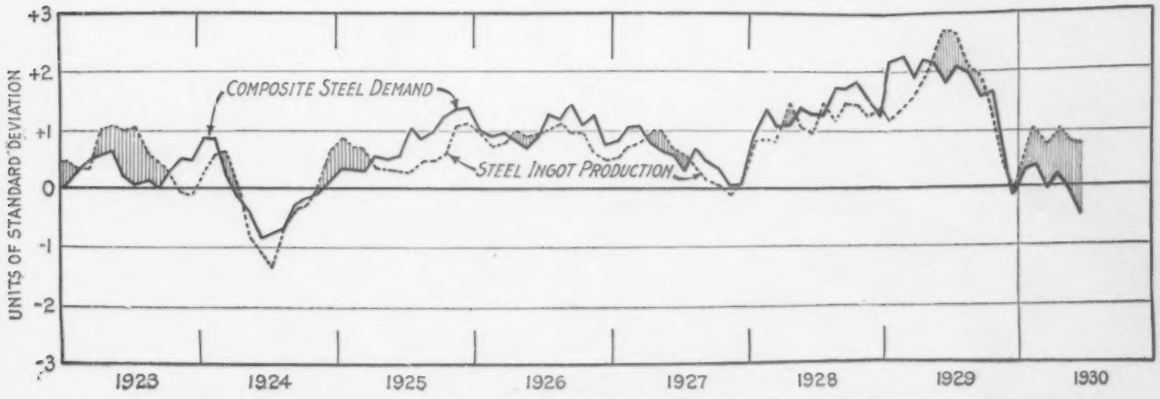
The *mining* industry continues to be further depressed each month, especially coal. The *oil* industry has not yet begun to revive.

Sales of various items of finished steel, as well as *machine tool orders*, made the poorest showing for June since 1924. These are sensitive indicators of manufacturing activity. *Exports* of iron and steel were the lowest since 1926.

Curtailment Must Go Deeper

The conditions revealed in the above analysis fit in with the showing of the P-V line. The latter has been below normal since early 1929 and declined again in June.

Curtailment of the volume of trade has gone far, but not far enough to stabilize commodity prices. Until price declines are checked, no improvement is to be expected, either in general business or in the demand for steel. It should be remembered, however, that out of pessimism and curtailment come the forces which bring recovery.



As the Spread Between Production and Demand Is the Greatest Since 1920, No Early Recovery Is Indicated

This Issue in Brief

Buffing speeds of 7200 to 12,000 ft. a minute give fine results in polishing chrome-nickel alloy steel for architectural decoration. Between these limits the operator exercises his judgment.—Page 354.

* * *

Using both machine tools and heat-treating furnaces in the same production line has given excellent results. Heat treating is considered as merely a part of the manufacturing process, just as is machining.—Page 357.

* * *

Automobile industry recuperation may be slow. New developments at Detroit include changes in designs, resumption of operations and the new Austin car. Working schedules are likely to be subject to current demand.—Page 363.

* * *

Getting business when times are hard is what one progressive foundry did by stimulating cooperation, whereby costs were lowered to a point at which the business could be obtained.—Page 341.

* * *

Bessemer steel still finds many uses. And it served its generation well in the early days of the machine age—railroads, agricultural equipment and many other products of steel owe their development to the outpouring of the converter.—Page 346.

Less pig iron came from American blast furnaces in July than they have turned out in any month since 1924. There were 16 fewer stacks working on Aug. 1 than on July 1.—Page 378.

* * *

Economies in foundry work made it possible for a plant to get business in spite of a business depression which held others to low tonnages of output.—Page 342.

* * *

Four factors affect the quality and physical properties of steel: its method of manufacture, chemical composition, deformation process and heat treatment.—Page 347.

* * *

Machinery goes abroad in large volume, in spite of the world-wide business depression. Exports in six months made a new high record, at $313,464,000.—Page 367.

* * *

Careful planning of the passes in a proposed rolling mill makes for success in rolling an ingot down to billet section. How this is done is told by a man who did it.—Page 351.

* * *

Speed of heat treating has to vary with thickness of section. With rotary-hearth furnace the rate of turning may be set to give a cycle of 15 min. for one part, or as much as 90 min. for another.—Page 358.

Large graphite crucibles, made in New Jersey, call for great care and precise control in their manufacture. Molding, drying and burning must be performed with circumspection, if the product is to have a useful life.—Page 349.

* * *

So long as production exceeds the demand for it we cannot hope for better conditions, Dr. Haney writes. Either steel output must be further curtailed or activity in steel-consuming industries must rise.—Page 369.

* * *

Abrasion or buffing wheels which have been used on brass or ordinary steel must be completely redressed before being applied to rustless steel. Otherwise etching pits or other defects may result.—Page 355.

* * *

Imports under the new tariff bill were at a lower daily rate. Under the old bill, for 17 days in June the rate was 1725 tons a day; but only 1510 tons a day came in after the new bill went into effect.—Page 365.

* * *

Taking the men into partnership was more than an idle gesture in a Massachusetts foundry. They had to share in losses due to poor work, as well as in profits from good work, but a basis was established which was fair to all concerned.—Page 342.

▲▲▲ PERSONALS ▲▲▲

A. F. MURPHY was appointed works manager of the Zanesville division of the American Rolling Mill Co. at Zanesville, Ohio. Armco will now have four manufacturing divisions, Ashland, Ky., Middletown, Butler, Pa., and Zanesville. Each is in charge of a resident works manager. Heretofore Zanesville has been a part of the Middletown division. S. R. RECTANUS is vice-president in charge of operations. Mr. Murphy was first employed as a laborer in the Zanesville plant in 1906. He was made superintendent of the plant in 1910, and on Jan. 1, 1922, became plant manager at Zanesville.

A. F. Murphy

Leo. F. Reinartz

G. D. Tranter

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L. F. REINARTZ, assistant general superintendent since 1923, has been appointed works manager of the Middletown division of the American Rolling Mill Co. He will be in charge of operations at East Works and Central Works in Middletown. He joined the company in July, 1909, as a chemist in the open-hearth department. He served successively as night assistant superintendent, turn foreman, assistant superintendent and superintendent of the open-hearth at Middletown. On Feb. 1, 1923, he was made assistant general superintendent at Middletown. The position of general superintendent has been created for the Middletown division and G. D. TRANTER, open-hearth superintendent, was selected to fill it. S. E. GRAEFF has been made assistant general superintendent at Middletown. Mr. Tranter became a member of the Armco organization in September, 1911. On Oct. 1, 1923, he was appointed open-hearth superintendent.

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JACKSON BURGESS, manager, Burgess-Parr Co., Moline, Ill., manufacturer of calorimeters, will move to Chicago, where he will direct a general sales office for the company. W. D. STALEY, who has been assistant manager for the last two years, will succeed Mr. Burgess as manager of the plant.

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R. LEROY REPLOGLE, for several years associated with the Johnstown, Pa., iron and steel industry, has joined the Boston office of the Warren Foundry & Pipe Co.

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JAMES S. FENTON has been promoted to the position of sales engineer of the New York office of the Reliance Electric & Engineering Co., Cleveland.

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ALEX BENECKE, the American representative of the Deutsche Edelstahlwerke, A.-G., has returned to his New York office, 347 Madison Avenue, after a visit to the steel mills of the company in Germany.

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E. C. GAINSBORG, formerly Pittsburgh representative of the S K F Industries, has been appointed Pittsburgh district manager of the Cleveland Crane & Engineering Co.

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JAMES B. ARMSTRONG, 1 East Forty-second Street, New York, has been appointed sales representative for the Reading Steel Casting Co. He will continue to represent the Lebanon Drop Forge Co. and other companies.

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LEON E. THOMAS, president, Reading Iron Co., subsidiary of the Philadelphia & Reading Coal & Iron Co., resigned July 31. The office of chairman of the board of directors has been created by the Reading Iron Co. and A. J. MALONEY, president of the parent company, is the new chairman. He will assume the executive duties of the president until a successor to Mr. Thomas is appointed.

C. T. CONNELLY, formerly of the Detroit office of the Independent Pneumatic Tool Co., Chicago, manufacturer of pneumatic and electric tools, has been appointed manager of the company's Buffalo office.

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H. R. GRAM has been appointed Eastern district sales manager for the Seneca Iron & Steel Co., Buffalo, with offices at 3314 Chrysler Building, New York. He succeeds F. B. KEITH, who has been transferred to other duties. Mr. Gram has been with the Seneca company for 10 years, five of which have been spent in the New York office. WALTER I. WILSON, formerly of the company's Buffalo office, will be transferred to the New York office.

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ROBERT W. HEERLEIN has resigned as president, treasurer and general manager of the Flint Structural Steel Co., Flint, Mich., and will devote several months to travel. His interest in the company has been acquired by ELMER R. DAIL, manager, Jarvis Engineering Works, Lansing, Mich., who will succeed him as president. EDWARD H. PERKINS becomes treasurer and general manager.

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PAUL R. CLARK, formerly president, Fireproof Products Co., has been appointed New York district manager of the Genfire Steel Co., with offices at 31 Union Square, New York, and 605 Broad Street, Newark, N. J.

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GEORGE W. W. CORNMAN, treasurer, and manager of the service department of the Brown Instrument Co., will retire from business Aug. 8. He has been in the instrument business for 35 years, being secretary and treasurer of the Keystone Electrical Instrument Co. when it was absorbed by the Brown Instrument Co., in which he became treasurer and a director as well as active head of the service department. R. C. KENNAN and E. T. NAHILL will now be in charge of the service department.

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EVERETT CHAPMAN has been appointed director of development and research of Lukenweld, Inc., division of Lukens Steel Co., Coatesville, Pa. He will have general direction of laboratory and investigation work in connection with redesigning of machinery parts for the welded steel type of construction. He was graduated from the University of Michigan in 1924, and was director of research for the Lincoln Electric Co. He is credited with inventing the Electronic Tornado welding process.

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CARL STRIPE, publicity director of the Combustion Engineering Corporation, was elected chairman of the

Exhibitors Committee of the Power Show to be held in New York in December. Other officers elected include VICTOR WICHUM, chief engineer, Tagliabue Mfg. Co., vice-chairman; W. W. BERTRAM, New York, sales manager, Morse Chain Co., secretary, and J. P. FERGUSON, sales engineer, Reading Steel Casting Co., treasurer.

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FRED C. YOUNG has been appointed general manager of sales of the Union Drawn Steel Co., a subsidiary of the

F. C. Young

Republic Steel Corporation. He has been with the Union Drawn Steel Co. for 16 years, including 4 years at the Detroit district office and 9 years at the Cleveland district office. In August, 1928, he became assistant general manager of sales of the company. He will succeed GEORGE MITCHELL, who has resigned as vice-president in charge of sales of the Union Drawn Steel Co.

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R. H. PRATT, formerly manager of the cold rolled strip and spring department in the New York office of the American Steel & Wire Co., has been made assistant general manager of sales succeeding R. L. FOSTER, who resigned to become general manager of sales for the Wickwire Spencer Steel Co. Other promotions are JOHN GRAHAM to manager of the cold rolled strip and spring department, New York, and W. H. JENNINGS, assistant general manager of sales at Baltimore.

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D. A. LEACH, formerly of the New York office of the Chicago Bridge & Iron Works, has been placed in charge of a sales office which the company has opened in the Exchange Bank Building, Tulsa, Okla.

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JAMES F. DONAHUE, vice-president, Lamson & Sessions Co., Cleveland, accompanied by wife and daughter, sailed on Aug. 5 on the Berengaria for two months' vacation in Europe.

T. L. LEWIS has resigned as general manager of sales for the A. M. Byers Co., Pittsburgh, effective Aug. 1, to become associated with the Norvell-Wilder Supply Co., Beaumont, Tex., distributer of oil country goods. He had been identified with the Byers company for 18 years and had been sales manager for 12 years. GEORGE E. CLIFFORD, Pittsburgh division manager for the Byers company, has also resigned and has been appointed assistant sales manager of the pipe division, Republic Steel Corporation, Youngstown.

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CHARLES F. TREADWAY, formerly secretary and treasurer of the Peck, Stow & Wilcox Co., Southington, Conn., has been elected executive vice-president.

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I. W. TURNER, White Plains, N. Y., has been appointed to the New York sales office of Pittsburgh Valve, Foundry & Construction Co., of which Ray B. Felker is manager. Mr. Turner was formerly with the Ingersoll-Rand Co.'s New York sales office. After completing a course at the New Mexico School of Mines, he entered the employ of L. E. Foster, consulting engineer, Silver City, New Mexico. He also spent a year with the Detroit Conveyor Co. as erection engineer.

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G. M. EATON has been made director of research with the Spang Chalfant Co., Pittsburgh.

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PROF. WALTER J. WOHLENBERG, a member of the faculty of the Sheffield Scientific School, Yale University, has been appointed the first Sterling Professor of Engineering.

H. A. LOMAX, as mentioned in this column, July 31, is now general manager of the Wheeling Mold & Foundry Division of the Continental Roll & Steel Foundry Co., Wheeling, W. Va.

RALPH A. SHERMAN, formerly fuel engineer, United States Bureau of Mines, Pittsburgh, has been appointed to the staff of the Battelle Memorial Institute, Columbus, Ohio, to direct research on combustion.

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JAMES T. MACKENZIE, metallurgist, American Cast Iron Pipe Co., Birmingham, was recently given the honorary degree of Doctor of Science by the University of the South, Sewanee, Tenn., "in recognition of his distinguished scholarship and outstand-

J. T. MacKenzie

ing achievements in scientific endeavor." He was graduated from the University of the South in 1911 and has been associated for the past 18 year with the American Cast Iron Pipe Co., where most of his research work has been conducted.

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NORMAN B. WOOD has been made production manager of the Metal Ware Corporation, Two Rivers, Wis.

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CHARLES C. PHELPS, manufacturers' agent, 11 Park Place, New York City, has been appointed sales agent for Metropolitan New York and Northern New Jersey by the Leavitt Machine Co., Orange, Mass., to handle the Dexter valve reseating machine for globe, gate and pump valves.

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DANTE M. PIERCE, Des Moines, Iowa, has been elected vice-president and director of the Galloway Co., Waterloo, Iowa, manufacturer of farm implements, succeeding A. T. Cole, Des Moines. C. E. BUTLER, was re-elected president of the company.

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GEORGE B. ASHLEY, formerly with the Detroit Lubricator Co., Detroit, has been appointed Syracuse, N. Y., representative of the Ex-Cell-O Aircraft & Tool Corporation, Detroit, and WILLIAM S. GALLAGHER, formerly with the R. C. Neil Co., Buffalo, has been appointed representative of the Ex-Cell-O company in the Buffalo territory.

Electrochemists to Discuss Electric Gray Iron

A symposium on corrosion will be the chief event at the fall meeting of the American Electrochemical Society, to be held at the Hotel Statler, Detroit, Sept. 25 to 27. Dr. F. N. Speller, National Tube Co., Pittsburgh, is responsible for the symposium and will preside. It will be devoted to the cause and prevention of corrosion in the automotive industry. Various phases of the advantages of rust-proof steels and other alloys, corrosion-resistant metal coatings on steel and brass, and the relative serviceability of oxide and other films produced on metals by heat treatment or chemical processes will be discussed.

Another feature of the convention will be a round table discussion on electric gray iron, which is to be in charge of A. T. Hinckley, chairman, and H. M. St. John, secretary-treasurer of the electrothermic division.

Papers at the session of the electrodeposition division of the society will include several on electroplating, with two in particular to give the results on the electrodeposition of alloys. Silver, zinc, cadmium, nickel, chromium and cobalt will be included in the program. The new chairman of the division is Prof. Arthur K. Graham, and the secretary-treasurer is Charles H. Eldridge of the General Chromium Corporation, Detroit.

The spring meeting in 1931 will be held at Birmingham, April 23 to 25. The principal scientific-technical session will be devoted to electrochemistry and ceramics, under the chairmanship of Prof. McVay, University of Alabama. The headquarters will be at the Hotel Tutwiler.

General Refractories Co.'s 1930 earnings may exceed those of last year, even though the 1929 earnings of $8.51 a share were at an all-time peak. Earnings during the first quarter of 1930, $2.53, were a high record for the eighth consecutive quarter. Company's net earnings for the quarter ended June 30, 1930, were $621,475, compared with $614,566 in the corresponding quarter of 1929. These net earnings applicable to the 300,000 shares of common stock outstanding were at the rate of $2.07 a share in 1930 and $2.05 in the second quarter of 1929. The earnings for the six months ended June 30, 1930, were $1,381,516, against $1,206,310 in 1929, or at the rate of $4.60 a share in the current year, against $4.02 in the first six months of 1929.

A. M. Castle Co., Chicago, reports for the three months ended June 30, 1930, net earnings, after all charges, of $136,683 equivalent to about $1.14 a share on the 120,000 shares outstanding. This compares with $1.12 a share earned in the first three months of this year.

▲ ▲ ▲ OBITUARY ▲ ▲ ▲

JAMES K. CULLEN, president, Niles Tool Works Co., Hamilton, Ohio, and former president of the Niles-Bement-Pond Co., New York, died on Aug. 1 at Hot Springs, Va., following an attack of apoplexy. Mr. Cullen was born in Cincinnati in 1853. His early experience in machine shop work was obtained in the shops of

James K. Cullen

the Cincinnati, Hamilton & Dayton Railroad and the Big Four Railroad. He left railroad work to become foreman at the Niles plant, where he rose through the positions of superintendent, Western representative and secretary to the presidency when R. C. McKinney became president of the Niles-Bement-Pond Co. He later succeeded Mr. McKinney as president of the consolidated company, but when the Niles-Bement-Pond Co. was reorganized as a holding company instead of an operating company, Mr. Cullen returned to Hamilton as head of the Niles Tool Works Co.

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ELLIS F. MUTHER, who for more than 25 years was connected with the Gisholt Machine Co., Madison, Wis., died suddenly at his home in Chicago last week. Mr. Muther was general manager of sales of the Gisholt company from 1914 to 1926, and prior to that was New York sales representative from 1905 to 1914. He left the Gisholt company to establish the Gardner Metal Co. of Chicago, which was engaged in the handling of nonferrous metals.

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CHARLES C. BOLTON, identified for 26 years until his retirement in 1904 with M. A. Hanna Co., Cleveland, died in that city July 31, aged 75 years. For many years he was a director of the National Refining Co. and the Bourne-Fuller Co. Surviving are four sons, among whom are Irving C. Bolton, treasurer, Warner & Swasey Co., Cleveland, and Julian C. Bolton, Hanna company.

WILLIAM A. MCGONAGLE, president of the Duluth, Missabe & Northern Railroad and acting head of the Duluth & Iron Range Railroad, died at Duluth, Aug. 2. He was born in Conshohocken, Pa., March 28, 1861. He was graduated from the University of Pennsylvania in 1881 and began his railroad career in that year as transit man in the survey for the Little Falls & Dakota branch of the Northern Pacific. In 1901 he became assistant chief engineer for the Duluth & Iron Range Railroad.

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JOSEPH C. WICKERSHAM, for several years identified with the Koppers Construction Co., Pittsburgh, as an inspector of various types of steel construction, died at his home in that city on July 28, aged 60 years. He was born in York County, Pa., and began his business career in the steel industry at Harrisburg, Pa. In 1916 he became chief metallurgist for the Carbon Steel Co., Pittsburgh, and later served as assistant general superintendent for that company. When the company passed out of existence in 1922 he joined the Koppers organization.

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FRANK J. OAKES, general superintendent of the Dodge Works of Link-Belt Co., Indianapolis, died suddenly at his home, July 19, of apoplexy, aged 54 years. He was born at Decatur, Ill., and entered the service of the Link-Belt Machinery Co., Chicago, in 1894, as repairman and general machinist. He was a pioneer in developing processes for the heat treatment of steel and held patents on inventions in the chain industry and in other fields.

Remarkable Safety Record

American Sheet & Tin Plate Co., Pittsburgh, operated the following plants during June, 1930, without a single lost-time accident:

Cambridge Tin Mill, Cambridge, Ohio, employing 315 operatives; Dover Sheet Mill, Dover, Ohio, 420 operatives; Guernsey Sheet Mill, Cambridge, Ohio, 517 operatives; Leechburg Sheet Mill, Leechburg, Pa., 146 operatives; New Philadelphia Sheet Mill, New Philadelphia, Ohio, 411 operatives; Roll & Machine Works, Canton, Ohio, 238 operatives; *Pennsylvania Tin Mill, New Kensington, Pa., 441 operatives; Sabraton Tin Mill, Morgantown, W. Va., 425 operatives; Shenango Tin Mill, New Castle, Pa., 1660 operatives; Wood Sheet Mill, McKeesport, Pa., 535 operatives; American Tin Mill, Elwood, Ind., 1108 operatives.

*This plant has the unique record of having gone 365 days without a single lost-time accident.

W. W. MACON
Editor

THE IRON AGE

A. I. FINDLEY
Editor Emeritus

ESTABLISHED 1855

Wanted, a Pacifier

PERHAPS, as this present period in steel is looked back on a year or two hence, the industry will congratulate itself on having all its troubles at once rather than singly. We can conceive of the lawsuit at Cleveland over the Bethlehem-Youngstown merger proving no small drawback in a normal time, both because of the ill will injected into the competitive relations of important factors in the industry and of the impression made on the public by the disclosure of very large and unusual rewards to steel executives. But, with the steel trade depressed, the battle at Cleveland simply figures as an added complication in a difficult situation—as a visitation for which time will bring the cure just as time must be counted on for the return of prosperity to the industry and to all business.

No legal battle has so stirred the steel trade as has this between the Eaton forces on the one hand and on the other the Bethlehem company and the majority interests in the Youngstown Sheet & Tube Co., since the famous Carnegie-Frick encounter of 1898. But this last was confined to a single company, albeit the giant of its time, and did not get to the point of threatening the whole industry, so swift were the moves of the leaders in the consolidations of 30 years ago. Now, after more than 20 years of friendly relations of leaders in the industry, so well promoted by Judge Gary, comes this impact of opposing forces and with it the application of X-rays to the internal organisms of two corporations whose highly capable executives have long been prominent in the councils of the American Iron and Steel Institute.

We do not believe that the Cleveland litigation will develop into a major factor affecting the recovery of the steel trade, though its possible effects on the competitive situation are not to be ignored. That it will have a place in the coming Congressional campaign goes without saying. No doubt some of the questions asked in the Cleveland court room will be repeated, as applying to other steel companies, at various stockholders' meetings in the next nine months. That should not hurt the industry. By and large its financial conduct has been on a high plane and in no other branch of manufacture has there been a more detailed or more understandable presentation of the facts which stockholders need to know in order to be assured of the soundness of their investment. What the Bethlehem-Youngstown impasse calls for is the intervention of a pacifier. There must be somewhere a man no less talented than the New Jersey jurist who drafted the truce which ended the Carnegie-Frick war of 1898.

A Moratorium on Predictions

IT would be a good thing for practically everybody if a moratorium on predictions as to business improvement were agreed upon. In the first place such predictions do not really serve any useful purpose and in the second place any single prediction has only a very slim chance indeed of being verified.

Granting for the sake of argument that the condition of business reflects a state of mind and that if the state of mind could be favorably altered it would have a good effect on business, predictions are not serving in that connection because the time of recovery is so variously stated. If predictions united on a certain month for trade improvement it might have a good effect, but the predictions range from this month into next year, and of course a prediction for a later date is interpreted as a prediction that improvement will not occur earlier. If all predictions united on a certain time there might be something in it.

Particularly open to question are predictions that trade will improve in August or September. If they do not mention the matter of seasonal improvement, they are gratuitous, for in poor years and good years alike seasonal variation is to be expected. If they do mention that the predicted improvement is a seasonal one, their influence is disquieting by implying a suggestion that general conditions are so poor that improvement has been in doubt.

As to the validity of the predictions, there would be more basis for confidence in them if the prophets were able to furnish a satisfactory explanation in quantitative terms of how things went wrong in the first place. It is not adequate merely to say that there was "too much" expansion or production or speculation. How much too much? It would seem logical to take it that if the amount of excess could be measured there would be a probability of normal being restored when a corresponding deficiency had been accumulated. Prophets find it difficult to cast up such an account, because it is necessary to make up a normal trend line from which to measure excesses and deficits, and trend lines differ according to the period taken. Should one begin with 1923 or go back further to include the preceding depression? If this difficulty deters the prognosticators from casting up the balance it may be suggested it would be better if it deterred them from making predictions.

It is recalled that for six months after the World War started the familiar question "How's business?" was replaced by the question "How long do you think the war will last?" The idea was that poor times

would last as long as the war. It was a wrong idea and harping on it made matters worse. The better idea would have been, how can one do business during this war, and the same suggestion is appropriate today.

We should have a moratorium on predictions as to when this depression will end, and more suggestions as to how we can get along, and how we should conduct ourselves, while it lasts.

Shipbuilding as an Industrial Factor

SHIPBUILDING affects perhaps as many industries, businesses and labor as any other activity. Iron and steel, non-ferrous metals, machinery, textiles, lumber, leather, food, transportation, finance, advertising, real estate and miscellaneous merchandise are some of the items stimulated. To encourage a merchant marine, therefore, is to support the prosperity and welfare of the nation. As a unit of national security its necessity is manifest.

It is gratifying to observe the increasing activity of American shipyards. The rebound on the manifold lines that feed shipbuilding undoubtedly has been an element in checking the downward trend of industry generally.

At the same time shipbuilding itself has well deserved a revival of activity. Its long depression was a serious drain on an investment calculated at more than $200,000,000 and, until the Jones-White act was passed, it was a question whether the industry, highly complicated, would survive to anything like the proportions required for a great commercial nation like the United States. There was a genuine threat that a large section of the industry and its skilled labor would disappear, from a dearth of business. Actually, one old, established yard was dismantled.

Now that new ships are on the ways as the result of mail contracts and other causes, and more will be constantly required, it is to be sincerely hoped the industry will flourish. This looks to be a bright prospect. The shipbuilder and the ship owner should work together, for what is to the interest of one is to the interest of the other. The former is entitled to a fair margin of profit and the latter apparently is ready to pay it. To go beyond or below that point is not good economics.

When the Postoffice Department awards a mail contract to a shipowner, the latter is, of course, bonded to guarantee fulfillment of the contract, which generally calls for building new ships of a certain type within a specified time. Knowing the revenue from the contract, the shipowner may safely estimate what his outlay should be for the ships, and be willing to see that it is sufficient to compensate the builder adequately.

It also follows that the builder should submit bids based on costs of construction plus a reasonable profit. To base them on the exigency of a contract, which, under bond, makes rigid demand for ships within a certain time, would in the end defeat efforts to create an American merchant marine, with all that that implies industrially and otherwise.

One hundred years ago American ships carried 90 per cent of our water-borne foreign commerce. Thirty years ago the American flag covered only 10 per cent of our cargoes. Today we are back to 35 per cent and the ratio is increasing slowly. The sea was long neglected, while our vast interior domain was under development. It behooves us now to round out our national activities by cultivating, once more, the business of ship operation on a large scale. Therein lie great possibilities.

Preachment with Practice

WHAT the great metal-working industry can do, in the present situation, by a well-considered outlay for machinery replacement was pointed out in these columns three weeks ago. As a text we had the monthly letter of General Manager Du Brul to the membership of the National Machine Tool Builders' Association, in which he suggested that there are machine tool builders who might themselves do what they have been urging their customers to do in plant improvement and cost reduction against the next forward movement.

It is not out of place to say in this connection that THE IRON AGE has done something more than preach the taking of a reasonable amount of risk in behalf of the better business of the future. In the first six months of 1929, when business in the industry represented by this journal was declining, our expenditure for editorial and contributed articles was greater than in any other half-year in our history. In no like period have our reading columns carried so many contributions of outstanding value to our clientele. The rationale of this policy is that in a time of reaction a business paper gets its best and most thoughtful reading; that is the time when its readers are searching for ways and means of carrying on most effectively and of bringing their businesses through the period of stress in the soundest condition.

The time when men in industry are forced to think most deeply on their problems is the time, we believe, when their business paper should not only maintain its service to them but, if possible, increase it beyond the ordinary. It need scarcely be said that the income and the atmosphere of unprosperous times do not favor enlarged outlay. It must be justified by confidence in future improvement and in the ability to share in it when it comes. It is some such combination of faith and works, as we understand it, that General Manager Du Brul has been commending to the machine tool builders as the latter urge their customers to make replacements in preparation for the better business that is ahead.

Steel Prices and Profits

THE influence of steel prices on earnings is well recognized, but what should now interest the producing trade, and no doubt will, is the influence of earnings, or lack of earnings, upon steel prices. It is largely a question of how far sellers will go, where the resistance point will be found.

Earnings reports for the June quarter are interesting in their way but are no criterion for the future, since current prices are in many cases below the averages realized on second quarter shipments and tonnage is much reduced, making higher unit costs in addition to furnishing less business on which a profit might be made.

There have been such differences among the finished

steel products, as to tonnage and prices, that there has been no uniform ratio by which earnings of individual steel companies would decline from first quarter to second quarter. Only a comprehensive profit and loss account made up on a uniform basis from reports of all the steel companies would show what the industry as a whole has done.

To illustrate, sheets, strips and wire products, except for certain specialties, have had low earnings or none at all, while rails and tin plate have been profitable. Rail production decreased somewhat from first quarter to second while production in the current quarter will be much lighter. Tin plate shipments on the other hand increased from first to second quarter while they will have quite a seasonal decrease for the current quarter. If there were one company making rails exclusively and another making tin plate exclusively their earnings would not run together at all.

Tubular goods present a case of their own. The price of standard pipe was reduced about $4 a ton April 1, but there has been greatly increased production of line pipe, welded and seamless, since the first quarter and prices on that commodity have little connection with prices on standard pipe.

By reason of these divergences in products it is no particularly unfavorable reflection upon the management or equipment of a given company if it showed a large decrease in earnings from first quarter to second, and no particularly favorable reflection if it showed a small decrease.

In considering earnings of the steel trade as a whole it is best to take steel as a commodity rather than earnings reports. From first quarter to second, with the advantage of one more working day in the second quarter, there was a decrease of 4.6 per cent in steel ingot production. The decrease in steel shipments was somewhat less, as there was more steel in process of finishing April 1 than July 1. The July rate of ingot production was about 25 per cent under the second quarter average, and no one really knows that the quarter will average more. Probably a 10 per cent increase July to August and a further 10 per cent increase August to September would exceed the highest hopes entertained, but that would leave the quarter about 18 per cent under second quarter.

As to prices, the finished steel composite of THE IRON AGE averaged a decline of nearly $2 a ton from first quarter to second, while the present composite is a dollar a ton under the second quarter average.

Here is a combination of decreasing production, higher unit costs and lower realized prices, influencing an earnings decrease from first quarter to second, but a much larger decrease from second quarter to third.

In the past when conditions became bad it was the regular thing for sellers to sit up and take notice. But apparently they were not greatly influenced to action—such as endeavoring to hold prices—until they saw the earnings statements of competitors. There is no occasion now to wait for third quarter earnings statements to come out, if producers really desire to save what they can from the situation.

CORRESPONDENCE

Asks Machine Tool Builders to Take Their Own Medicine

To the Editor: With reference to the editorial in the July 17 issue of THE IRON AGE, it is indeed unfortunate that machine tool manufacturers as a whole do not take their own medicine and install "modern machine tools, the master tools of industry."

Most machine tool plants in this country are filled up with machine tools of antiquated design, and it is costing these manufacturers a lot of money to use these antiquated machine tools because the new, modern, more highly productive machine tools will produce work many times faster and at greatly reduced costs.

We have always been of the opinion that the time to prepare for good business was during times of bad business or depression. We practiced this in the depression of 1921, during which time we almost completely revamped our machine tool equipment, and as a consequence our margin of profit on sales since that period has been the best in our history.

In the past two months we have sold 35 machine tools from our plant, which tools are from 5 to 8 years old, and these tools are being replaced with a less number of similar machine tools of up-to-the-minute design, and we know that these new tools we are putting in will pay for themselves in lower production costs at least within the next two years.

We are operating our plant today with a reduced force and on reduced time but we are operating at a profit, are earning our dividends, and are placing our house in order to take full advantage of the next revival in business, which will come as it has always come in the past.

If the chief executives of the manufacturing plants of this country would "sit-in" a little more often with their production men and cost department men and get a more intimate knowledge of the difference in costs of production on obsolete equipment and new, up-to-date-machine-tool equipment, and would take more seriously the data compiled by their cost and production departments, we believe the replacement demand for machine tools would be far better today than it is. Undoubtedly these executives would see that it is actually costing them money to use obsolete equipment, even though they are running their plants today on reduced schedules.

A Machine Tool Builder.

Unemployment Results Partly from Expanded Installment Buying

To the Editor: I read with a great deal of interest your editorial "Unemployment, Technological and Other" in the issue of July 24. With your analysis of the various contributing causes leading up to the "technological unemployment" of the present I find myself in general agreement.

There is one contributing cause, which appears to me to be very significant, which I do not find mentioned. It is centered about the tremendous expansion which has taken place in credit purchasing through deferred payments by the individual of average means. Speaking in very general terms, it appears as though that credit expansion has taken place within the past four or five years. Without attempting to evaluate the status of deferred pay-

The Week in Business

Drift of Current Financial and Economic Opinion

FURTHER contractions in industrial activity have occurred, but Harvard Economic Society sees evidence accumulating that "the pace of output has already been cut below the needs of current consumption. . . . There is increasing confidence, and increasingly frequent expression of confidence, in a prompt beginning of business revival."

Lower Prices Must Be Universal

That a lowering of prices is bringing accrual of business is noted by *Commerce and Finance*, which cites the recent experience of mail order houses. "This reduction and others now being made . . . should have their effect in stimulating consumption. The increase is not, however, likely to be apparent for some weeks yet, and the miasma of pessimism which prevailed until recently will be dispelled but slowly."

But this lowering of prices cannot be one-sided, if prosperity is to return. *Commercial and Financial Chronicle* argues that declining prices for farm products must be matched, all along the line, in what the farmer must buy. "In this sense the general downward tendency of commodity prices must be viewed as a favorable . . . development. It is nothing more nor less than a corrective process by which the proper equilibrium all around will be restored."

"No one apparently is conscious of the fact that this is no time for wage increases," the same commentator adds. "Now a new order has to be faced, and the sooner this is recognized the better. . . . The old methods would have been eradicated years ago, except that we were living in an era of inflation. . . . The spirit will now have to be changed, if we would get back to a normal basis where activity will flourish in accordance with normal, natural scales."

Consumption of Goods Has Been Large

Corporations producing consumption goods have suffered less than those making capital goods, Alexander Hamilton Institute finds. "Herein the institute sees only the evidence of the normal workings of a decline in business." And many observers have noted that productive processes have fallen far more sharply and deeply than has the consumption of goods by the "ultimate consumer."

Annalist reiterates its belief that our productive capacity, in a multitude of lines, is swollen far beyond a normal relation to "any near-by consumer capacity for absorbing a high percentage of its products." All of which argues a relatively low employment of productive facilities until consumer demand shall have measurably caught up.

But "August will bring definite signs of improvement," according to *Business Week*, "beginning with the basic industries. And as we move further into the last half, the paralyzing pessimism of recent months will find less to feed on, in the comparative records of this year and last."

Doubts the Lasting Value of Installment Buying

Occasionally the detached view of European observers serves to throw light on our problems. The Westminster Bank of London is now quoted as not doubting that "the march of the United States to greater wealth and power cannot in the long run be impeded."

But "the 'prosperity campaign' itself, which has succeeded by purely artificial means, and especially through the increased propagation of the system of installment buying, in maintaining luxury—or at any rate non-essential—consumption at an unjustifiably high level," is one factor tending to explain the extent of the trade reaction.

Commenting on this point, the *New York Times* refers to "surprisingly few defaults on contracts of that kind." But the "mere continuance of payments on such contracts, entered into at the height of speculative enthusiasm, must have added to the public's inability to make new purchases."

ment purchasing per se, but viewing it solely from the viewpoint of its effect on production facilities, I believe it is in a great measure responsible.

Prior to its inception, the average consumer desiring a luxury article of comparatively high cost saved his money diligently until he had the necessary cash, when he came into the market as a prospective purchaser. During this period of saving, he ofttimes temporarily lost sight of his major goal, and purchased luxury or comfort articles of comparatively small costs. This meant then that each year through advance saving a certain number of people came into the market for large luxury items. When deferred payments became general practice, it accelerated the consumer demand from these people of average means temporarily, in that it moved up their time of entering the market, by the difference between the time needed to earn and save the money first, and that of purchasing first and earning and saving afterward.

This naturally increased the consumer demand during the years of transition, so that manufacturers, losing sight of the fundamental force at work, increased their production facilities to meet the demand during this accelerated period, which they blindly regarded as representative of a new normal demand. Now that the vast majority of people of average means have absorbed the differential, so that they should not or cannot enter the deferred payment market for luxury products until they have paid off outstanding obligations for goods purchased but still to be paid for in part, demand has reverted to approximately the real original normal in effect before the temporary boost induced by expanding personal credit.

This return to normal demand, depending on current earnings now universally applied in anticipation rather than as a realization of past earnings, has created the impression that more direct and obvious causes are the underlying motive in the reduction of employment. Not only are these people of average means bought up to the hilt on large luxury items, but through fear of the other forces unleashed, they are holding back on all but necessary purchases of small items, so that they can be reasonably certain to meet their payments on the articles they have bought on anticipation. This then, which I hope I have made clear, represents a situation which will require patience and time to readjust, and a permanent reconciliation to the fact that the accelerated consumer demand of the transition period cannot longer be regarded as a normal prosperity demand.

JOHN F. HARDECKER,
Naval Aircraft Factory,
Philadelphia.

Sharp Drop in Iron Output in July

Loss in Daily Rate of 12,658 Tons or 13 Per Cent— Net Loss of 16 Furnaces

WITH returns from every active blast furnace, the production of pig iron in July was sharply off from that of June. The decline in daily rate was 13 per cent as compared with 6.2 per cent in June.

Production of coke pig iron in July was 2,639,537 gross tons or 85,146 tons per day for the 31 days. This contrasts with 2,934,129 tons or 97,804 tons per day for the 30 days in June. The falling off in daily rate for July was, therefore, 12,658 tons or 13 per cent. This contrasts with a decline of 6479 tons per day in June or 6.2 per cent and with 1.7 per cent in May. The daily rate last month was the smallest since November, 1924, when it was 83,656 tons. The July daily rate this year is the smallest for that month since 1924, when it was 57,577 tons per day. In 1925, the July daily rate was 85,936 tons, only 790 tons larger than that for last month.

Totals for 7 Months

Production for the first seven months of this year was 20,900,849 tons which is 17.8 per cent less than for the same seven months last year (25,426,080 tons) but only 3.2 per cent under the 21,592,745 tons to Aug. 1, 1928.

There were 18 furnaces blown out or banked and only two blown in during July, a net loss of 16. In June the loss was 20 furnaces. In the last four months there has been a net loss of 41 furnaces against a net gain of 28 in the first three months.

Several large furnaces were banked during part of July, cutting down the normal production for the actual

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1926—Gross Tons

	1926	1927	1928	1929	1930
Jan.	106,974	100,123	92,573	111,044	91,209
Feb.	104,408	105,024	100,004	114,507	101,390
Mar.	111,032	112,366	103,215	119,822	104,715
Apr.	115,004	114,074	106,183	122,087	106,062
May	112,304	109,385	105,931	125,745	104,283
June	107,844	102,988	102,733	123,908	97,804
½ year	109,660	107,351	101,763	119,564	100,891
July	103,978	95,199	99,091	122,100	85,146
Aug.	103,241	95,073	101,180	121,151	.....
Sept.	104,543	92,498	102,077	116,585	.....
Oct.	107,553	89,810	108,832	115,745	.....
Nov.	107,890	88,279	110,084	106,047	.....
Dec.	99,712	86,960	108,705	91,513	.....
Year	107,043	99,266	103,382	115,851	.....

Pig Iron Production by Districts, Gross Tons

	July (31 days)	June (30 days)	May (31 days)	April (30 days)
New York and Mass.	162,328	215,442	215,704	225,752
Lehigh Valley	67,348	69,996	76,699	85,179
Schuylkill Valley	44,312	37,911	46,752	53,216
Lower Susq. and Lebanon Valley	19,426	22,503	42,915	43,173
Pittsburgh district	605,414	647,557	677,743	663,679
Shenango Valley	70,917	67,861	72,570	67,106
Western Pennsylvania	61,886	75,140	106,875	120,415
Maryland, Va. and Ky.	93,697	97,980	112,233	120,786
Wheeling district	142,492	149,070	168,365	156,170
Mahoning Valley	246,176	255,071	280,193	264,319
Central and North'n Ohio	258,435	276,722	284,849	275,700
Southern Ohio	47,076	48,279	48,264	48,463
Illinois and Indiana	507,822	620,941	719,328	682,171
Mich., Minn., Mo., Wis. Colo. and Utah	119,769	125,598	144,381	140,186
Alabama	192,002	222,330	234,289	233,972
Tennessee	437	1,728	1,600	1,581
Total	2,639,537	2,934,129	3,232,760	3,181,868

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchant Iron*	Total
July, 1929	98,044	24,056	122,100
August	98,900	22,251	121,151
September	95,426	21,159	116,585
October	93,644	22,101	115,745
November	83,276	22,771	106,047
December	68,152	23,361	91,513
January, 1930	71,447	19,762	91,209
February	81,580	19,810	101,390
March	83,900	20,815	104,715
April	85,489	20,573	106,062
May	84,310	19,973	104,283
June	77,883	19,921	97,804
July	66,949	18,197	85,146

*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

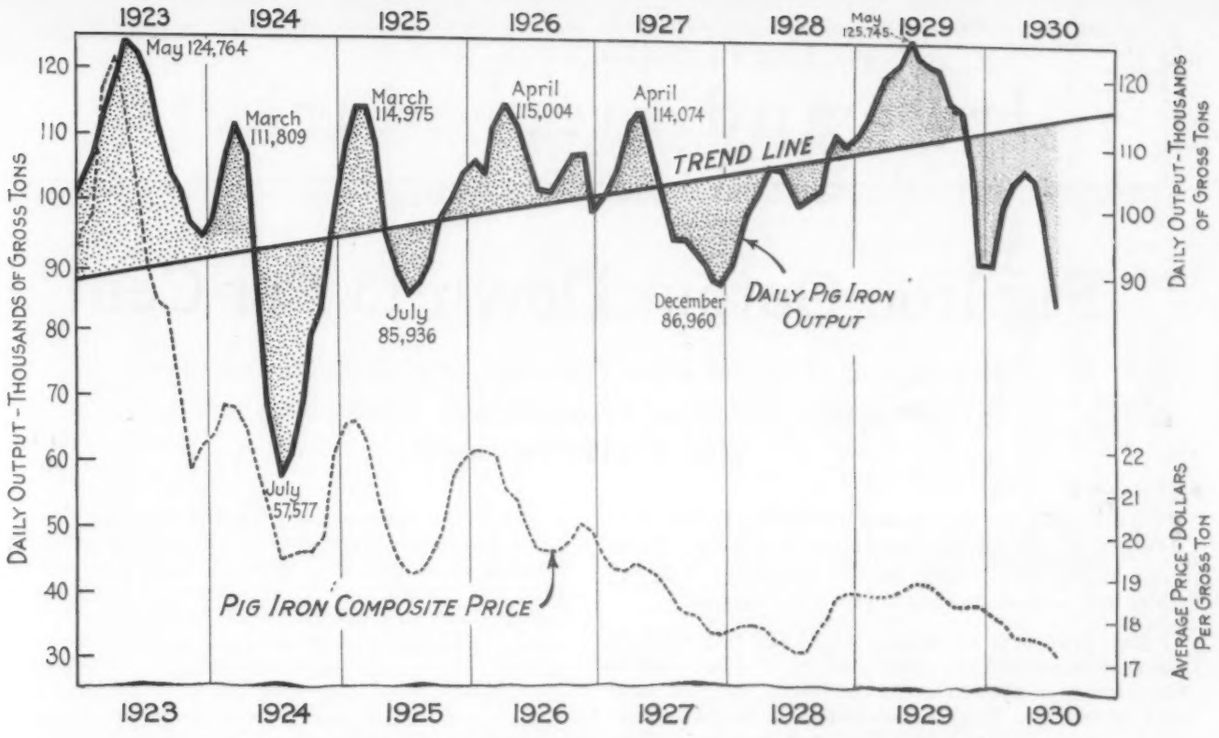
Furnaces	August 1 Number in Blast	August 1 Rate of Operation	July 1 Number in Blast	July 1 Rate of Operation
New York:				
Buffalo	8	4,800	11	6,185
Other N. Y. and Mass.	2	565	2	515
New Jersey	0	....	0	....
Pennsylvania:				
Lehigh Valley	5	2,170	5	2,330*
Schuylkill Valley	2	1,020	3	1,260
Susquehanna Valley	1	550	1	450
Ferromanganese	0	....	1	95
Lebanon Valley	0	....	0	....
Ferromanganese	0	....	0	....
Pittsburgh District	28	18,470	31	20,870
Ferro. and Spiegel.	3	620	3	475
Shenango Valley	4	2,285	4	2,260
Western Pennsylvania	3	1,810	3	1,700
Ferromanganese	2	185	2	255
Maryland	4	2,450	4	2,635
Wheeling District	7	4,755	7	4,670
Ohio:				
Mahoning Valley	11	7,170	13	7,740
Central and Northern	14	8,335	14	8,750
Southern	4	1,520	4	1,610
Illinois and Indiana	22	16,100	26	19,050
Mich., Wis. and Minn.	6	2,700	6	2,935
Colo., Mo. and Utah	2	775	3	1,250
The South:				
Virginia	1	210	1	250
Kentucky	1	355	1	380
Alabama	14	6,800	14	6,870
Ferromanganese	0	....	0	....
Tennessee	0	....	1	55
Total	144	83,645	160	92,590

*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months Beginning Jan. 1, 1928—Gross Tons

	1928	1929	1930
Jan.	2,869,761	3,444,370	2,827,464
Feb.	2,900,126	3,206,185	2,838,920
Mar.	3,199,674	3,714,473	3,246,171
Apr.	3,185,504	3,662,625	3,181,868
May	3,283,856	3,898,082	3,232,760
June	3,082,000	3,717,225	2,934,129
½ year	18,520,921	21,640,960	18,261,312
July	3,071,824	3,785,120	2,639,537
7 months	21,592,745	25,426,080	20,900,849
Aug.	3,136,570	3,755,680	.....
Sept.	3,062,314	3,497,564	.....
Oct.	3,373,806	3,588,118	.....
Nov.	3,302,523	3,181,411	.....
Dec.	3,369,846	2,836,916	.....
Year*	37,837,804	42,285,769	.....

*These totals do not include charcoal pig iron. The 1929 production of this iron was 138,193 gross tons.



Daily production of pig iron is now lower than the bottom of the 1925 valley.

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 1,275,000 tons

number operating during the month. Some shut-downs lasted two to three weeks.

Operating Rate on Aug. 1

Estimated operating rate for the 144 furnaces active on Aug. 1 was 83,645 tons per day. This compares with 92,590 tons daily for the 160 stacks blowing on July 1.

The two furnaces blown in during July are credited to the Steel Corporation. Of the 18 furnaces blown out or banked, nine were independent steel company stacks, five were merchant and four belonged to the Steel Corporation. The net loss in steelmaking furnaces was 11.

Manganese Alloy Output

There was a large output of spiegeleisen in July. The ferromanganese output was 17,728 tons, or the smallest this year. It is the smallest since the 17,710 tons made in October, 1927.

Furnaces Blown In and Out

Only two furnaces were blown in during July: No. 4 Mingo furnace of the Carnegie Steel Co. in the Wheeling district and No. 6 Ensley furnace of the Tennessee Coal, Iron & Railroad Co. in Alabama.

Among the furnaces blown out or banked during July were one Susquehanna furnace of the Hanna Furnace Co., one Donner furnace of the Republic Steel Corporation and one furnace at the Lackawanna plant of the Bethlehem Steel Corporation in the Buffalo district; one Worth furnace of the Bethlehem Steel Corporation in the Schuylkill Valley; the Sheridan furnace in the Susquehanna Valley; one Aliquippa furnace of the Jones & Laughlin Steel Corporation, No. 1 Midland furnace of the Pittsburgh Crucible Steel Co., and No. 1 Monessen furnace of the Pittsburgh Steel Co. in the Pittsburgh district; No. 3 Ohio furnace of the Carnegie Steel Co. and the Anna furnace in the Mahoning Valley; No. 3 Mingo furnace of the Carnegie Steel Co. in the Wheeling district; one South Chicago furnace of the Illinois Steel Co., a furnace of the St. Louis Gas & Coke Co., No. 1 Gary furnace and No. 3 furnace of the Inland Steel Co. in Illinois and Indiana; one furnace of the Colorado Fuel & Iron Co. in Colorado; and the Rockdale furnace of the Tennessee Products Corporation in Tennessee.

Production of Steel Companies for Own Use—Gross Tons

	Total Pig Iron Spiegel and Ferromanganese			Ferromanganese*		
	1928	1929	1930	1928	1929	1930
Jan.	2,155,133	2,651,416	2,214,875	22,298	28,208	27,260
Feb.	2,274,880	2,498,901	2,284,234	19,320	25,978	21,310
Mar.	2,588,158	2,959,295	2,600,980	27,912	24,978	23,345
Apr.	2,555,500	2,826,028	2,564,681	18,405	22,413	27,777
May	2,652,872	3,105,404	2,613,628	29,940	25,896	30,296
June	2,448,905	2,999,798	2,304,223	32,088	33,363	27,327
½ year	14,675,448	17,040,842	14,582,621	149,963	160,836	157,325
July	2,464,896	3,039,370	2,075,414	32,909	31,040	17,728
7 months	17,140,344	20,080,212	16,658,035	182,872	191,876	175,053
Aug.	2,561,904	3,065,874	.....	24,583	28,461	.....
Sept.	2,477,695	2,862,799	.....	22,278	27,505	.....
Oct.	2,729,589	2,902,960	.....	23,939	31,108	.....
Nov.	2,654,211	2,498,291	.....	29,773	31,866	.....
Dec.	2,647,863	2,112,704	.....	28,618	28,564	.....
Year	30,211,606	33,522,840	.....	312,063	339,380	.....

*Includes output of merchant furnaces.

The East St. Louis (Ill.) City Council has passed an ordinance authorizing the Terminal Railroad Association of St. Louis to erect a new passenger station there. The station is to be built near Main Street and Broadway and will cost $800,000, including approaches.

Iron and Steel Markets

Pig Iron Output Down 13 Per Cent

Net Loss of 16 Active Blast Furnaces—Steel Releases Not Yet Materially Stimulated by Automobile Resumptions—Steel Production Tapers

JULY proved another month of drastic deflation of pig iron production, bringing blast furnace operations a long step nearer to the inevitable "bottom" which will precede the next upturn in business.

The daily rate of output, at 85,146 tons, fell 13 per cent below the per diem average of June. Active blast furnaces showed a net decline of 16, compared with 20 in June. The production rate of the 144 stacks in service on Aug. 1, at 83,645 tons, was lower than the daily average for any month's output since October, 1924.

Aside from this evidence of sharp retrenchment there is little in market developments to reveal the trend of iron and steel business in the immediate future. Resumption of operations by automobile manufacturers has thus far given little impetus to demands on suppliers of materials, although counted on to bring some measure of improvement later. Prices, particularly of finished steel products, still show marked irregularity, and buying continues to be held back by the excessive caution that characterizes periods of uncertainty. Widespread drought, which has now reached an alarming stage, has further clouded the business outlook.

Among the few sources of encouragement are continued stability in the scrap market—with a few price advances reported where the supply of certain grades has run low—increased tractor output under the stimulus of foreign orders and a gain in pig iron shipments to foundries in the Chicago district.

The opinion still prevails that iron and steel business will show at least a seasonal gain within the next month or two, but the current trend of steel ingot production is slightly downward, with the average for the country at large at 54 per cent, compared with the 56 per cent rate that prevailed in the four previous weeks.

The failure of automobile resumptions to result in larger releases of iron and steel is ascribable to left-over inventories of materials in the hands of motor car builders, to their starting on smaller schedules than when they shut down and to uncertainty as to the trend of retail sales. The Ford Motor Co. has reopened its plant on a four-day a week schedule and plans to make 7000 to 7500 cars daily, while the Chevrolet company aims to produce 55,000 cars during the current month, but these rates are subject to change as variations in consumer demand dictate.

Pipe line tonnage remains the strongest support of the steel mills. The Republic Steel Corporation has received an order for 60 miles of 12-in. pipe from the Southern Natural Gas Co. of Alabama. The Columbia Gas & Electric Corporation plans to lay a double 24-in. natural gas line from West Virginia and Ohio to the Atlantic seaboard. The Moody-Seagraves Corporation contemplates a gas line from the same fields to Great Lakes cities, while the Sun Oil Co. is in the market for gasoline-carrying pipe to extend from Philadelphia to Syracuse, N. Y. A natural gas line from Texas through Omaha to Minneapolis is among the latest projects to be promoted.

The Milwaukee fabricator of electrically welded pipe shipped 2226 carloads of pipe (65,000 tons) in July and entered August with 7000 carloads on order.

The current drought, although of broad business import, is of immediate concern to makers of tin plate, wire products and sheets. Tin plate output ranges from 60 to 65 per cent of capacity, and, while canning crops have not yet been badly affected except in one or two districts, another week without rain would bring serious consequences.

Steel prices are very sensitive and the fact that they have shown fewer open breaks of late may be due to the paucity of attractive orders. Buyers are operating on very low inventories but are in no mood to replenish their stocks. Among the few attractive tonnages coming before the trade at present are those involved in large structural projects, and in the East, where much of the current fabricating activity is concentrated, plain material prices are subject to wide variation. Cold-rolled strip steel, after showing signs of stability at 2.45c., Pittsburgh, has again declined to 2.35c. At Chicago, rail steel bars are down $2 a ton and galvanized sheets $1. Concessions on galvanized and black sheets are reported along the Atlantic seaboard.

Total pig iron output in July was 2,639,537 tons, compared with 2,934,129 tons (97,804 tons a day) in June. Production in the first seven months was 20,900,849 tons, as against 25,426,080 tons in the corresponding period in 1929 and 21,592,745 tons in 1928. The decline from last year's total was 17.8 per cent and from the 1928 period 3.2 per cent.

THE IRON AGE composite prices are unchanged, pig iron at $16.96 a ton and finished steel at 2.171c. a lb.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Aug. 5, 1930	July 29, 1930	July 8, 1930	Aug. 6, 1929
No. 2 fdy., Philadelphia	$19.76	$19.76	$19.76	$21.26
No. 2, Valley furnace	18.00	18.00	18.00	18.50
No. 2 Southern, Cin'ti	16.69	16.69	16.69	17.69
No. 2, Birmingham	14.00	14.00	14.00	14.50
No. 2 foundry, Chicago*	17.50	17.50	18.00	20.00
Basic, del'd eastern Pa.	18.75	18.75	18.75	19.75
Basic, Valley furnace	18.00	18.00	18.00	18.50
Valley Bessemer, del'd P'gh.	20.26	20.26	20.26	20.76
Malleable, Chicago*	17.50	17.50	18.00	20.00
Malleable, Valley	18.50	18.50	18.50	19.00
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	94.00	94.00	94.00	105.00
Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	31.00	31.00	31.00	35.00
Sheet bars, Pittsburgh	31.00	31.00	31.00	35.00
Slabs, Pittsburgh	31.00	31.00	31.00	35.00
Forging billets, Pittsburgh	36.00	36.00	36.00	40.00
Wire rods, Pittsburgh	36.00	36.00	36.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.85
Finished Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.65	1.65	1.65	1.95
Bars, Chicago	1.75	1.75	1.75	2.05
Bars, Cleveland	1.75	1.75	1.75	1.95
Bars, New York	1.98	1.98	1.98	2.29
Tank plates, Pittsburgh	1.65	1.65	1.65	1.95
Tank plates, Chicago	1.75	1.75	1.75	2.05
Tank plates, New York	1.88	1.93	1.93	2.22½
Structural shapes, Pittsburgh	1.65	1.65	1.65	1.95
Structural shapes, Chicago	1.75	1.75	1.75	2.05
Structural shapes, New York	1.85½	1.85½	1.90½	2.19½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.30
Hot-rolled strips, Pittsburgh	1.65	1.65	1.65	1.90
Cold-rolled strips, Pittsburgh	2.35	2.45	2.45	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel,	Aug. 5, 1930	July 29, 1930	July 8, 1930	Aug. 6, 1929
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.45	2.45	2.55	2.85
Sheets, black, No. 24, Chicago dist. mill	2.60	2.60	2.65	3.05
Sheets, galv., No. 24, P'gh	3.10	3.10	3.15	3.50
Sheets, galv., No. 24, Chicago dist. mill	3.20	3.25	3.25	3.80
Sheets, blue, No. 13, P'gh	2.15	2.15	2.15	2.35
Sheets, blue, No. 13, Chicago dist. mill	2.25	2.25	2.25	2.45
Wire nails, Pittsburgh	2.05	2.05	2.05	2.55
Wire nails, Chicago dist. mill	2.10	2.10	2.15	2.65
Plain wire, Pittsburgh	2.30	2.30	2.30	2.50
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.55
Barbed wire, galv., P'gh	2.80	2.80	2.80	3.20
Barbed wire, galv., Chicago dist. mill	2.85	2.85	2.85	3.35
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.35
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$14.75	$14.75	$14.75	$18.75
Heavy melting steel, Phila	12.50	12.50	12.50	16.50
Heavy melting steel, Ch'go	12.00	12.00	12.00	14.75
Carwheels, Chicago	13.50	13.50	13.50	14.00
Carwheels, Philadelphia	14.50	14.50	14.50	16.50
No. 1 cast, Pittsburgh	13.50	13.50	13.50	15.50
No. 1 cast, Philadelphia	13.00	13.00	13.00	16.50
No. 1 cast, Ch'go (net ton)	12.00	12.00	12.00	14.50
No. 1 RR. wrot., Phila	15.00	15.00	15.00	16.00
No. 1 RR. wrot., Ch'go (net)	10.00	10.00	10.00	13.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.50	$2.50	$2.50	$2.75
Foundry coke, prompt	3.50	3.50	3.50	3.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	11.12½	11.12½	12.12½	18.12½
Electrolytic copper, refinery	10.75	10.75	11.25	17.75
Tin (Straits), New York	30.25	29.87½	29.75	47.25
Zinc, East St. Louis	4.50	4.75	4.10	6.80
Zinc, New York	4.85	5.10	4.45	7.15
Lead, St. Louis	5.35	5.15	5.15	6.55
Lead, New York	5.50	5.25	5.25	6.75
Antimony (Asiatic), N. Y.	8.25	7.12½	7.00	8.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

PITTSBURGH

Resumption of Automobile Production and Other Minor Gains Aid Steel Market

PITTSBURGH, Aug. 5.—With shipments to the automobile industry slightly heavier this week, and minor improvements in other steel-consuming lines, the new month is bringing a slightly better tone to the Pittsburgh market. Although activity is centered chiefly in specifications against old contracts, consumers are beginning to show more interest in new buying, and this is giving steel companies a more hopeful attitude.

Minor increases in the operating schedules of sheet and strip mills are reported from various plants in the district, and one or two companies have put on open-hearth furnaces. In spite of this, adjustments elsewhere have kept steel ingot output at 55 to 60 per cent of capacity, where it has stood for several weeks. Likewise aggregate finishing mill schedules show little change, with line pipe units running at practical capacity and various other departments ranging down to less than 50 per cent.

Tin plate operations are still declining, but are now better adjusted to current demand than they were. Sheet mill schedules have been stepped up a few points, and a considerable improvement in output of cold-rolled strip is reported. On the heavy hot-rolled products no change is in evidence. Reinforcing bars and structural shapes continue to account for the bulk of shipments in these lines.

Resumption of operations this week by the Ford Motor Co. and other automobile makers, as well as by parts and accessory manufacturers which serve these companies, has had favorable sentimental effect on the steel market. Even though most of these companies resume production on smaller schedules than were in effect before the plants closed down, improvement is expected before the end of the month if at all justified by consumer demand. These gains may be partially offset by curtailment on the part of other motor car builders, but the automotive industry is not expected again to reach the low levels of July, when the leading interest was entirely out of the market. Releases on automotive materials for shipment this week were not as heavy as they might have been in view of the fact that suspensions went into effect with some raw materials in inventory.

The heavy steel requirements of pipe mills are doing much to maintain ingot production in the Pittsburgh and Valley districts at its present rate. Pipe line inquiries are still numerous, and considerable more tonnage may be accommodated this season in spite of the well-filled mill order books. Besides the proposed gas line for the Columbia Gas & Electric Corporation, mentioned elsewhere, a large gas line in the West, extending from the Texas fields to Omaha, is again active. To be built by a company organized expressly for that purpose, the first section of the line will take 400 to 500 miles of pipe,

while a proposed extension to the Twin Cities, if built, would more than double this tonnage. The project will be submitted to popular vote in Omaha at an early election. The Moody-Seagraves Corporation contemplates a gas line from Ohio and West Virginia fields to Great Lakes cities, while the Sun Oil Co. is in the market for gasoline-carrying pipe to extend from Philadelphia to Syracuse, N. Y.

No inquiries of importance have come from the railroads recently, but the usual buying season is not far off. Specifications for rail and track accessories improved slightly at the end of the past month.

Weather conditions throughout the greater part of the country have become a serious menace to crop conditions, and steel plants serving the agricultural implement makers, also can manufacturers, are beginning to view the situation with concern.

Steel prices are generally unchanged, with weakness confined principally to the extension of present minimum quotations to smaller buyers than had hitherto enjoyed them. In the meantime, shading on desirable tonnage has not disappeared, but is less frequent because of the lack of heavy tonnage inquiries.

Resumption of shipments to automobile industry and other minor gains give steel market better tone.

* * *

Ingot output in Pittsburgh and the Valleys, however, has not risen above the 55 to 60 per cent of recent weeks.

* * *

Heavy schedules of pipe mills help to maintain present steel ingot rate. More pipe line projects pending.

* * *

Drought in agricultural sections viewed with concern by steel companies and can manufacturers.

* * *

Steel prices generally unchanged, but minimum prices are being extended to smaller buyers than have heretofore enjoyed them.

Semi-Finished Steel.—No apparent change in demand has developed in the last week. Shipments during July were the lightest of any month this year. Prices on billets, slabs and sheet bars are nominally unchanged at $31, Pittsburgh or Youngstown, with small-lot sales of forging billets bringing $36, Pittsburgh. Wire rods are quiet, and the price is steady at $36, Pittsburgh or Cleveland.

Pig Iron.—New buying has not improved, but shipments to a few producers have been slightly higher in the last few days. Jobbing foundries in the district, which are operating on an average of less than three days a week, are content to cover their iron needs on a weekly basis, and generally demand prompt shipment. Steel foundries are doing little better, and makers of iron and steel rolls and ingot molds are running at no more than 50 per cent. Current transactions are generally being made on the basis of $18, Valley, and $18.50, Pittsburgh furnace, for foundry iron, with malleable and Bessemer quoted 50c. higher at each base. The basic market has been given no recent test, the nominal quotation remaining at $18, Valley. A steel company in the Pittsburgh district is beginning to receive iron on a recent contract from a maker down the river.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$18.00
Bessemer	18.50
Gray forge	17.50
No. 2 foundry	18.00
No. 3 foundry	17.50
Malleable	18.50
Low phos., copper free	$26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$18.50
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

Bars, Plates and Shapes.—Although structural mills in this territory are benefitting by heavier business in the East, lettings in the immediate Pittsburgh territory are very light, and little new inquiry is coming out. The larger fabricating shops are running at a fair rate, but smaller companies are experiencing difficulties in keeping their plants running at all and are operating on a very uncertain basis.

No barge business is coming out, although a shortage exists in river craft of this type, and barge builders reconcile themselves with the thought that business can not be postponed indefinitely. Shipments of plates to local car builders have been falling off and may decline even further in the next few weeks, unless car shops are able to book additional business. Fabricators of oil tanks are running fairly well, but plate demand as a whole is decidedly stagnant. Bar mill operations are being held up to some extent by reinforcing bar tonnage, but this business is now confined principally to old orders.

Prices have not changed materially. Most of the current tonnage is going at 1.65c., Pittsburgh, although mixed carloads and other small lots occasionally command 1.70c. Concessions on attractive tonnages, especially in plates and shapes, have not disappeared.

Rails and Track Supplies.—Specifications improved slightly at the end of the month, but the railroads are still restricting shipments on most of their orders. Following the placing of 1931 rail requirements by the Van Sweringen roads, the rail market is rather quiet, as no new inquiries have formally come out. Prices are nominally unchanged.

Bolts, Nuts and Rivets.—Operations in this industry average from 40 to 50 per cent, with a number of plants completely suspended for inventory purposes and lack of orders. Slightly heavier shipments to the automobile industry last week have given the market a better tone. Prices are unchanged.

Tubular Goods.—No new line pipe orders have been reported placed in the last week, but negotiations are still under way on some projects which

The Iron Age Composite Prices

Finished Steel

Aug. 5, 1930, 2.171c. a Lb.

One week ago	2.171c.
One month ago	2.185c.
One year ago	2.412c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High	Low
1930	2.362c., Jan. 7;	2.171c., July 15
1929	2.412c., April 2;	2.362c., Oct. 29
1928	2.391c., Dec. 11;	2.314c., Jan. 3
1927	2.453c., Jan. 4;	2.293c., Oct. 25
1926	2.453c., Jan. 5;	2.403c., May 18
1925	2.560c., Jan. 6;	2.396c., Aug. 18

Pig Iron

Aug. 5, 1930, $16.96 a Gross Ton

One week ago	$16.96
One month ago	17.25
One year ago	18.42

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1930	$18.21, Jan. 7;	$16.96, July 29
1929	18.71, May 14;	18.21, Dec. 17
1928	18.59, Nov. 27;	17.04, July 24
1927	19.71, Jan. 4;	17.54, Nov. 1
1926	21.54, Jan. 5;	19.46, July 13
1925	22.50, Jan. 13;	18.96, July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.65c. to 1.70c.
F.o.b. Chicago	1.75c. to 1.85c.
Del'd Philadelphia	1.94c.
Del'd New York	1.98c.
F.o.b. Cleveland	1.70c. to 1.75c.
F.o.b. Lackawanna	1.75c. to 1.85c.
F.o.b. Birmingham	1.90c.
C.i.f. Pacific ports	2.25c.
F.o.b. San Francisco mills	2.25c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft.	1.60c. to 1.65c.
F.o.b. P'gh mills, cut lengths	1.90c. to 2.00c.
F.o.b. Birmingham, mill lengths	1.90c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.65c. to 1.70c.
F.o.b. Chicago Heights mill	1.65c.
Del'd Philadelphia	1.94c. to 1.99c.

Iron

Common iron, f.o.b. Chicago	1.75c. to 1.85c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.65c.
F.o.b. Chicago	1.75c. to 1.80c.
F.o.b. Birmingham	1.90c.
Del'd Cleveland	1.83½c.
Del'd Philadelphia	1.80½c. to 1.85½c.
F.o.b. Coatesville	1.70c. to 1.75c.
F.o.b. Sparrows Point	1.75c.
F.o.b. Lackawanna	1.75c.
Del'd New York	1.88c. to 1.93c.
C.i.f. Pacific ports	2.15c. to 2.25c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.65c.
F.o.b. Chicago	1.75c. to 1.80c.
F.o.b. Birmingham	1.90c.
F.o.b. Lackawanna	1.75c. to 1.80c.
F.o.b. Bethlehem	1.75c. to 1.80c.
Del'd Cleveland	1.83½c.
Del'd Philadelphia	1.66c. to 1.76c.
Del'd New York	1.85½c. to 1.90½c.
C.i.f. Pacific ports	2.15c. to 2.25c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	1.70c. to 1.75c.
Wider than 6 in., P'gh	1.65c.
6 in. and narrower, Chicago	1.85c. to 1.90c.
Wider than 6 in., Chicago	1.75c. to 1.80c.
Cooperage stock, P'gh	1.90c. to 2.00c.
Cooperage stock, Chicago	2.00c. to 2.10c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill	*2.45c. to 3.40c.
Strips, P'gh	2.35c. to 2.45c.
Strips, Cleveland	2.35c. to 2.45c.
Strips, del'd Chicago	2.63c. to 2.73c.
Strips, Worcester	2.60c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.70c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Merchant Trade

	Base per Keg
Standard wire nails	$2.05 to $2.15
Cement coated nails	2.05 to 2.15
Galvanized nails	4.05 to 4.15

	Base per Lb.
Polished staples	2.50c. to 2.60c.
Galvanized staples	2.75c. to 2.90c.
Barbed wire, galvanized	2.70c. to 2.85c.
Annealed fence wire	2.30c. to 2.40c.
Galvanized wire, No. 9	2.75c. to 2.85c.
Woven wire fence (per net ton to retailers)	$65.00

To Manufacturing Trade

Bright hard wire, Nos. 6 to 9 gage	2.30c.
Spring wire	3.30c.

(Carload lots, f.o.b. Chicago)

Wire nails	$2.10 to $2.15 (keg)
Annealed fence wire	2.40c. to 2.50c. (lb.)
Bright hard wire to manufacturing trade	2.35c.

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Light Plates

	Base per Lb.
No. 10, blue annealed, f.o.b. P'gh	2.00c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.10c.
No. 10, blue annealed, del'd Phila.	2.32c. to 2.42c.
No. 10, blue annealed, B'ham	2.15c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh	2.15c.
No. 13, f.o.b. Chicago dist.	2.25c.
No. 13, del'd Philadelphia	2.44c.
No. 13, blue annealed, B'ham	2.30c.

Continuous Mill Sheets

No. 10 gage, f.o.b. P'gh	1.75c. to 1.80c.
No. 13 gage, f.o.b. P'gh	1.90c. to 1.95c.

(Usual range 24 in. to 48 in. wide)

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.45c. to 2.55c.
No. 24, f.o.b. Chicago dist. mill	2.60c. to 2.65c.
No. 24, del'd Philadelphia	2.84c.
No. 24, f.o.b. Birmingham	2.70c.

Steel Furniture Sheets

No. 24, f.o.b. P'gh	3.70c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.10c. to 3.20c.
No. 24, f.o.b. Chicago dist. mill	3.20c. to 3.30c.
No. 24, del'd Cleveland	3.28½c. to 3.33½c.
No. 24, del'd Philadelphia	3.39c. to 3.49c.
No. 24, f.o.b. Birmingham	3.25c. to 3.30c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.70c. to 2.80c.
No. 28, f.o.b. Chicago dist. mill	2.80c. to 2.90c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	3.60c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	3.55c. to 3.65c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.80c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.30
15-lb. coating I.C.	12.90
20-lb. coating I.C.	14.00
25-lb. coating I.C.	$15.20
30-lb. coating I.C.	16.00
40-lb. coating I.C.	17.80

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(1½% Nickel)	$0.25
2100	(1¼% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	34.00
Light (from rail steel), f.o.b. mill	32.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅜ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plate, steel	2.07½
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18

Lap Weld

2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49⅞	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discount of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discount a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

may be accommodated in the year's rolling schedules. The Columbia Gas & Electric Corporation has publicly announced its intention of building a gas-carrying line from its West Virginia and Ohio fields to the Atlantic seaboard, and states that a considerable portion of the project will require two parallel 24-in. lines. The tonnage involved would make this one of the most attractive orders of the year. Lapweld, seamless and electric welding pipe mills in this and the Youngstown districts are running at practical capacity, while the remainder of the industry is suffering from the generally depressed state of business. Shipments of standard pipe are about 25 per cent behind those of 1929, and mechanical tubing and boiler tubes are very quiet. Oil country casing is moving fairly well to the mid-continent fields, and conservation programs now in progress promise improved conditions in the future.

Wire Products.—The market is generally dull. Shipments in July fell off sharply from the average for the first quarter. Demand for manufacturers' wire has been sharply curtailed by suspended production in many consuming plants, and the merchant trade is adversely affected by the depressed condition of the agricultural industry. Nail prices are maintained in the immediate Pittsburgh district at $2.05 to $2.15, the lower price applying to jobber business. Manufacturers' wire is unchanged at 2.30c., Pittsburgh.

Sheets.—Slightly heavier orders from the automotive industry last week have stimulated the business of some companies, but demand is unevenly distributed. A few motor car builders are ordering out material to round up production on old models preparatory to changing their designs, and the Buick and Studebaker companies are maintaining production at a good rate on new models. Resumption of production by the Ford Motor Co. has produced a much better sentiment in the entire motor car industry, but the output of the other large producer of low-priced cars has been tapering off and the full extent of Ford's August production can only be estimated.

The steel furniture industry, which has been taking sheets at a fair rate, has reduced its requirements considerably in the last month. Shipments of galvanized sheets and roofing to the South and Southwest are picking up slightly, and car builders have been taking a fair tonnage as they complete orders booked during the winter. In most cases early delivery is a requisite of current orders, but mills have no difficulty in meeting shipping specifications, even with a 50 per cent operation. Prices are unchanged, with minimum quotations applying to a growing percentage of total business.

Tin Plate.—The industry in this district is running at about 60 per cent, with the leading interest maintaining a slightly higher rate. Specifications are light, but the larger container manufacturers are taking their requirements in an interrupted manner, and no immediate effects of unfavorable weather conditions have yet been felt except in one or two isolated districts. Another week without rain would likely lead to more serious consequences.

Strip Steel.—A slight improvement in demand from the automotive industry has stimulated production a few points in this district, but strip makers are hesitant in predicting that this improvement will be maintained. Makers of automobile rims and other accessories have resumed production coincident with the renewed requirements of the Ford Motor Co., and a few large consumers of strip steel in other industries have reopened their plants following a summer "vacation."

Strip prices are holding fairly well, although reports of shading are not lacking. Makers have adopted a firmer price policy in the last two or three weeks, and many of them believe that the market is stronger today than it was a month ago. Cold-rolled strip is quoted at 2.45c., Pittsburgh, and wide hot-rolled at 1.65c. to 1.75c.

Coke.—Furnace coke is still available at $2.50, Connellsville, although larger producers are generally quoting $2.60. Production has dropped under 20,000 tons weekly in the Connellsville region—one of the lowest points in 20 years, and a slightly higher price seems likely within a short time. Foundry grade is dull, with shipments very light and prices weak except on the premium grades.

Old Material.—The scrap market has retained its strength in the last week despite the absence of mill buying in significant tonnage. Dealers are having more and more difficulty in covering old orders for No. 1 heavy melting steel, and $14.50, $14.75 and $15 are being paid frequently.

With scrap production sharply curtailed, the shortage of first grade material is more pronounced than ever, and dealers are unwilling to sell at prices suggested by mills. Hold-ups are still a factor in the market, and distress material is being offered occasionally at low prices. One consumer in the district has lifted its suspension of shipments of hydraulic compressed sheets, and dealers are attempting to cover this order in the Detroit district, where prices figuring out at $15.75 and even $16, Pittsburgh, have been paid.

Very little compressed sheet steel was produced in the Detroit district last month, and output during August is not expected to be much higher.

Machine shop turnings are weaker, and blast furnace grades have declined because of the lack of a shipping point. Heavy breakable cast is also off, but hand-bundled sheets have advanced 50c. a ton on the basis of a recent sale.

Warehouse Prices, f.o.b. Pittsburgh

	*Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.75c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.35c.
Squares and flats	3.85c.
Bands	3.10c.
Hoops	4.10c.
Black sheets (No. 24), 25 or more bundles	3.50c.
Galv. sheets (No. 24), 25 or more bundles	4.15c.
Light plates, blue annealed (No. 10), 1 to 24 plates	2.85c.
Blue annealed sheets (No. 13)	3.00c.
Galv. corrug. sheets (No. 28), per square	4.03c.
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 and 10 per cent off list
Machine bolts, 100 count,	60 and 10 per cent off list
Carriage bolts, 100 count,	60 and 10 per cent off list
Nuts, all styles, 100 count,	60 and 10 per cent off list
Large rivets, base per 100 lb.	$3.30
Wire, black, soft ann'l'd, base per 100 lb	$2.60 to 2.70
Wire, galv. soft, base per 100 lb	3.20 to 3.30
Common wire nails, per keg	2.45
Cement coated nails, per keg	2.65 to 2.80

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$14.50 to $15.00
No. 2 heavy melting steel	12.50 to 13.00
Scrap rails	14.50 to 15.00
Compressed sheet steel	14.75 to 15.00
Bundled sheets, sides and ends	12.50 to 13.00
Cast iron carwheels	15.00 to 15.50
Sheet bar crops, ordinary	15.50 to 16.00
Heavy breakable cast	11.00 to 11.50
No. 2 railroad wrought	14.50 to 15.00
Hvy. steel axle turnings	12.50 to 13.00
Machine shop turnings	8.00 to 8.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	17.00 to 18.00
Railr. coil and leaf springs	17.00 to 18.00
Rolled steel wheels	17.00 to 18.00
Low phos. billet and bloom ends	19.00 to 19.50
Low phos. mill plates	16.50 to 17.00
Low phos. light grades	16.50 to 17.00
Low phos. sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	12.50 to 13.00
Electric Furnace Grades:	
Low phos. punchings	17.00 to 17.50
Heavy steel axle turnings	12.50 to 13.00
Blast Furnace Grades:	
Short shoveling steel turnings	8.50 to 9.00
Short mixed borings and turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Rolling Mill Grades:	
Steel car axles	21.50 to 22.50
Cupola Grades:	
No. 1 cast	13.00 to 14.00
Rails 3 ft. and under	16.50 to 17.00

Detroit Scrap Unchanged

DETROIT, Aug. 5.—Prices on iron and steel scrap are unchanged from those of a week ago.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$11.00 to $11.50
Borings and short turnings	6.25 to 6.75
Long turnings	5.75 to 6.25
No. 1 machinery cast	11.25 to 11.75
Automotive cast	13.50 to 14.00
Hydraul. comp. sheets	10.50 to 11.00
Stove plate	9.00 to 9.50
New No. 1 busheling	9.50 to 10.00
Old No. 1 busheling	8.75 to 9.25
Sheet clippings	8.00 to 8.50
Flashings	9.75 to 10.25

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$31.00
Rerolling, 4-in. and under 10-in., Youngstown	31.00
Rerolling, 4-in. and under 10-in., Cleveland	31.00
Rerolling, 4-in. and under 10-in., Chicago	33.00
Forging quality, Pittsburgh	36.00

Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$36.00
Cleveland	36.00
Chicago	37.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c.
Iron ore, low phos., Swedish, average 68% iron	12.00c.
Iron ore, basic Swedish, average 65% iron	10.00c.
Manganese ore, washed 52% manganese, from the Caucasus	28.00c. to 30.00c.
Manganese ore, Brazilian, African or Indian, basic 50%	28.00c. to 30.00c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $14.00
	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2 delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.50 to $2.60
Foundry, f.o.b. Connellsville prompt	3.25 to 4.75
Foundry, by-products, Ch'go ovens	8.00
Foundry, by-products, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	.80 to .90
Gas slack, f.o.b. W. Pa. mines	.90 to 1.00

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$94.00 to $99.00
Foreign, 80%, Atlantic or Gulf port, duty paid	94.00 to 99.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $33.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	39.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$26.50	13%	$32.50
11%	28.50	14%	34.50
12%	30.50	15%	37.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$21.50	11%	$26.50
7%	22.00	12%	28.50
8%	22.50	13%	30.50
9%	23.00	14%	32.50
10%	24.50	15%	35.00

Delivered prices at Chicago are about 50c. a ton below this schedule.

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd	$1.30 to $1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to 18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works: High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	73
†Carriage bolts	73
Lag bolts	73
Plow bolts, Nos. 1, 2, 3 and 7 heads	73
Hot-pressed nuts, blank or tapped, square	73
Hot-pressed nuts, blank or tapped, hexagons	73
C.p.c. and t. square or hex. nuts, blank or tapped	73
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ¾ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	73
Semi-finished hexagon castellated nuts, S.A.E.	73
Stove bolts in packages, P'gh.	80, 10, 10 and 5
Stove bolts in packages, Chicago.	80, 10, 10 and 5
Stove bolts in packages, Cleveland.	80, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 5 and 2½
Stove bolts in bulk, Chicago.	80, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland.	80, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(⅞-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 40c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread,	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

CHICAGO

Moderate Turn Upward in Steel Orders Discernible —Pig Iron Shipments Larger

CHICAGO, Aug. 5.—The local iron and steel market, which a week ago gave some indications of betterment in tone, is now giving tangible evidence of a slight turn upward from the low point of demand. Specifications for immediate delivery of plates, shapes and bars show moderate improvement, and releases, particularly in bar mill products, seem to point to further improvement. Order mails to wire mills were light on Monday, but today brought about a reversal, and sellers are encouraged to the point where they believe the beginning of the usual August upturn in business is near. Shipments of pig iron are larger, and demand for bolts, nuts and rivets also shows a gain.

Conditions largely responsible for the improved situation are foreign orders for tractors, heavier output by plow manufacturers and the termination of the vacation period at a number of automobile plants. Sprinkled here and there in numerous industrial plants are small but improved needs for steel mill products.

Noteworthy in trade conditions is betterment of the business situation in the Northwest. The Minnesota Steel Co. has stepped up operations to 75 per cent of capacity and has added 400 men to the payroll. At Chicago 17 steel mill blast furnaces remain in use, and ingot output ranges from 55 to 60 per cent of capacity.

The outlook for pipe manufacture remains excellent. The manufacturer at Milwaukee last month shipped 65,000 tons and still has on order over 200,000 tons, which assures satisfactory operations at that plant for about three months. The Western fabricated steel market continues to move in a listless way. It is urgently in need of a good number of heavy tonnage projects.

Ferroalloys.—This market is virtually at a standstill. Specifications are small in the aggregate, and interest in new buying is at low ebb.

Sheets.—The general situation as it now exists in the sheet market is a keen disappointment to producers, who can usually count on a growing demand at this time of the year. Many of the grain crops have been harvested, and the period between Aug. 1 and the fall plowing season is one in which much outdoor work is done in rural districts. Usually by this time jobbers and distributers are taking in their supplies, but this year they have made little or no gesture in that direction.

With manufacturers finding small use for sheets and with a scarcity of outdoor work, nearby sheet mills are having difficulty in holding to 50 per cent of capacity. The hot mills at Milwaukee are down because of lack of orders. Sellers' anxiety for business has resulted in a reduction of $1 a ton on galvanized sheets, which are now being quoted at 3.25c. to 3.35c. a lb., delivered Chicago.

Aside from unsatisfactory operating schedules, which are resulting from lack of volume orders, mills in the mid-West are handicapped in production by extremely hot weather. Deliveries are gaged largely by the time that it takes to manufacture a given grade. Blue annealed sheets may be had in one week to 10 days. Box annealed in 10 days to two weeks and galvanized in two weeks. Galvanized roofing sheets may be taken from stock.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.65c. to 2.70c.; No. 24 galv., 3.25c. to 3.35c.; No. 10 blue ann'l'd, 2.15c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Pig Iron.—For several weeks the local trade has been kept on edge by substantial purchases, many of which were for the remainder of the year. This week added encouragement is given by larger shipments and releases that seem to assure that August shipments will be well above those of July, which were at the low point of the year. Sellers believe that the rate at which shipments will grow will be moderate over the remainder of this month. Production, which has stood at 60 per cent for several weeks, has been raised several points.

Prices in general are unchanged, with Northern foundry iron bringing $17.50 a ton, furnace, in tonnage lots. The silvery market is affected by keen competition between producers entering Chicago by rail and those which make use of water transportation.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.50 to $18.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00 to 18.50
Malleable, not over 2.25 sil.	17.50 to 18.00
High phosphorus	17.50 to 18.00
Lake Super. charc'l, sil. 1.50	27.04
S'th'n No. 2 fdy.	18.01 to 18.51
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	27.29
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Rails and Track Supplies.—Orders placed by the Chesapeake & Ohio disclose that of 58,600 tons of rails 25,000 tons went to the Illinois Steel Co., 19,300 tons to the Inland Steel Co., 8800 tons to the Bethlehem Steel Corporation and 5500 tons to the Carnegie Steel Co. Although this tonnage is largely for 1931 requirements, it is understood that part of it is for immediate or nearby delivery. Of interest in this market in the way of fresh inquiry is 9000 tons which the Great Northern will use for a new line from Klamath Falls, Ore., to Paxton, Cal. Miscellaneous orders during the week totaled 3000 tons, the bulk of which is for new work. Miscellaneous orders for track accessories are in good volume for this time of the year.

Reports are persistent that other large railroads will soon be in the market for rail needs for the coming year. Opinion among producers is divided on this point, some holding that next year's purchases cannot be expected earlier than the railroads usually enter the market.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.07½c. to 2.15c.; angle bars, 2.75c.

Cast Iron Pipe.—This market continues to run in about the same course as in July, when private buying resulted in one of the best months so far this year. Some sellers are optimistic as to the future and do not hesitate to predict that more cast iron pipe will be sold in the second half of the year than was sold in the first six months. It is admitted, however, that much of this, if it comes, will reach the market through private channels. This applies not only to private buyers in the strict sense of the word, but also in the sense that municipalities are slowly but surely turning to the practice of having pipe laid by private contractors who place the orders for pipe. Cheap money, which in the past has usually brought about an active cast iron pipe market, is now counted on by sellers to result in a revival of this market.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel—	
Less than 5 tons	2.85c.
5 tons to 30 tons	2.45c.
30 tons to 200 tons	2.00c.
200 tons and over	1.85c.
Rail steel reinforcement—	
Less than 5 tons	2.50c.
5 tons to 30 tons	2.10c.
30 tons and over	1.50c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.35c.
Flats and squares	3.85c.
Bands (¾ in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.60c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes (⅜ in. and larger)	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

	Per Cent Off List
Machine bolts	60 and 10
Carriage bolts	60 and 10
Coach or lag screws	60 and 10
Hot-pressed nuts, sq., tap. or blank.	60 and 10
Hot-pressed nuts, hex., tap. or blank.	60 and 10

No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	$2.30 to 2.50
Cement c't'd nails, base per keg	2.30 to 2.50

Vanceburg, Ky., will buy 200 tons of 4 to 8-in. pipe, and Detroit is in the market for 600 pieces of 6-in. pipe.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $45 to $46; 4-in., $48 to $49; Class A and gas pipe, $3 extra.

Reinforcing Bars.—Price changes again form the principal topic in the local market. One seller published a new schedule July 19 and it is understood others are in the making. As matters now stand, new billet reinforcing bars are priced from 2.85c. down to 1.85c. a lb., out of warehouse, for lots ranging from less than 5 tons to 200 tons and over. The rail steel commodity is being quoted at 2.50c. to 1.50c. a lb. for less than 5 tons to 30 tons and over. Rail steel bars for road slabs are marked at 1.65c., while material for bridge and culvert work command 1.75c. a lb.

New tonnage this week bulks large because of two awards which call for an aggregate of 2100 tons. Fresh inquiries are not impressive, except in the case of small tonnages which are more numerous. Shop operations average about 60 per cent of capacity.

Bolts, Nuts and Rivets.—For the first time in many weeks specifications show growth, and releases point to added betterment in demand. Heavier deliveries are being made to automobile plants that have resumed operations at the end of the vacation period. Plow manufacturers are again getting under way, and foreign orders for tractors have brightened the outlook in that field.

Wire Products.—Extremely hot weather, which tends to check outdoor work as well as to cause damage to some crops, is cutting demand for wire products in the rural communities of the Middle West. New orders and specifications from all sources are light, and operations continue at the low rate of 40 per cent of capacity. However, if business follows the course that wire products sellers have known it to in many a previous August, there can be some hope that orders will gain as the month advances.

Fencing is a commodity for which demand usually begins to broaden soon after the middle of August. Shipments of concrete mesh are in good volume except to the building trades. The bulk of current deliveries are now going into pavement, which so far as new contracts for this year are concerned will soon see the end of activity. This week has brought no changes in demand for electrical cables and magnet wire.

Crop reports indicate that growing conditions have not altered in the past two weeks, but larger areas of the country have suffered from extremely high temperatures and drought. The chief damage has been done to corn, which was planted early and which had reached the critical stage of its growth. However, if temperature conditions moderate and good rains come there will be a change for the better as crops are not too far gone to make a recovery under favorable conditions.

Plates.—This market shows little change from a week ago. Orders from car shops are small, though this week 6000 tons will be purchased for the 500 cars recently ordered by the Minneapolis & St. Louis. New orders for tankage steel are absent, but it is reported that several sizable inquiries are in the making. The A. O. Smith Corporation reports that in July it shipped 65,000 tons of pipe equivalent to 2226 carloads. The company entered August with about 7000 carloads of pipe on order.

Orders for steel in slightly better volume, and point to further improvement in near future.

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Plates, shapes, bars, bolts and nuts also register moderate gains.

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Pig iron shipments and releases are also larger. August shipments will exceed those of July.

* * *

Foreign orders for tractors, heavier output by plow manufacturers and resumption of operations by automobile plants aiding situation.

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Steel pipe fabrication active. Milwaukee fabricator shipped 65,000 tons of pipe last month and has upward of 200,000 tons still on books.

Structural Material. — Fabricators report that estimators are more busily engaged, but the market lacks the support of heavy tonnage projects. The Chicago & North Western has suspended its inquiry for 3200 tons of bridge material and is ordering as needed. A project which promises much is the viaduct and suburban terminal to be constructed by the Illinois Central at Randolph Street, Chicago.

Bars.—New orders and specifications for mild steel bars show some improvement over the volume a week ago. This is the result of resumption of operations at several automobile plants and heavier output by several tractor manufacturers which recently have received large orders for export. One tractor plant will furnish 12,000 machines for Russia.

Quotations on rail steel bars are off $2 a ton to 1.65c. a lb., Chicago Heights. Output is near the low point of the year, with one producing unit down temporarily. Demand from the barn equipment industry is normal for this time of year.

Coke. — Quotations on by-product foundry coke remain steady at $8 a ton, f.o.b. local ovens. Output in this district is in excess of shipments, but this is the usual condition at this time of the year when producers are accumulating tonnages of domestic and foundry coke for shipment during the fall and early winter.

Old Material.—Consumers are little interested in new tonnages, and sellers, who are uncertain as to the course of the market, are more or less content to let matters drift for the time being. One user of heavy melting steel has been taking no shipments for a number of weeks and another steel mill, having first restricted shipments, has for several days refused to accept cars. A few users have been willing to take moderate-sized tonnages at current low prices so that they may average down the price for scrap which is now in their yards.

Most quotations as now given have been untested for so long that they cannot be classed as anything more than nominal. On a few grades, malleable being one, dealers are raising their bids. The background of this move is not clearly defined. It may be an effort to cover old commitments or it may be that brokers are now desirous of taking a long position in the market.

Prices deliv'd Chicago district consumers:

Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel	$12.00 to $12.25
Shoveling steel	12.00 to 12.25
Frogs, switches and guards, cut apart, and misc. rails	13.00 to 13.50
Hydraul. compressed sheets	10.25 to 10.75
Drop forge flashings	8.50 to 9.00
No. 1 busheling	9.50 to 10.00
Forg'd cast and r'l'd steel carwheels	15.00 to 15.50
Railroad tires, charg. box size	15.50 to 16.00
Railroad leaf springs cut apart	15.50 to 16.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	13.50 to 14.00
Coil springs	16.00 to 16.50
Electric Furnace Grades:	
Axle turnings	11.25 to 11.75
Low phos. punchings	13.00 to 13.50
Low phos. plates, 12 in. and under	13.00 to 13.50
Blast Furnace Grades:	
Axle turnings	9.50 to 10.00
Cast iron borings	7.75 to 8.25
Short shoveling turnings	7.75 to 8.25
Machine shop turnings	6.00 to 6.50
Rolling Mill Grades:	
Iron rails	13.00 to 13.50
Rerolling rails	14.50 to 15.00
Cupola Grades:	
Steel rails, less than 3 ft.	13.75 to 14.25
Steel rails, less than 2 ft.	14.50 to 15.00
Angle bars, steel	13.25 to 13.75
Cast iron carwheels	13.50 to 14.00
Malleable Grades:	
Railroad	13.50 to 14.00
Agricultural	12.25 to 12.75
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:	
Iron angle and splice bars	12.00 to 12.50
Iron arch bars and transoms	13.50 to 14.00
Iron car axles	24.00 to 24.50
Steel car axles	15.00 to 15.50
No. 1 railroad wrought	9.75 to 10.25
No. 2 railroad wrought	10.75 to 11.00
No. 1 busheling	7.50 to 8.00
No. 2 busheling	6.00 to 6.50
Locomotive tires, smooth	14.50 to 15.00
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	12.00 to 12.50
No. 1 railroad cast	10.25 to 10.75
No. 1 agricultural cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Grate bars	8.50 to 9.00
Brake shoes	8.50 to 9.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

NEW YORK

Pig Iron and Steel Buying Does Not Reveal Trend of Immediate Future

NEW YORK, Aug. 5.—The pig iron market still is devoid of any convincing augury as to the immediate future. The week's sales, at 7500 tons, and those of the previous week, at 10,000 tons, are above the recent average, but foundry operations are so spotty that it is still impossible to ascertain whether actual improvement is under way. The hot weather, of course, has impeded work among foundries that have started up after mid-year suspensions, and for that reason the trade still looks for a numerical increase in pig iron orders, if not a gain in the tonnage booked.

Not a great deal of open inquiry is in the market, but for several months a major portion of the business booked has come as a result of intensive canvassing of customers rather than quoting on formal requests for prices. The General Electric Co. is inquiring for 1000 tons, of which 500 tons is for Pittsfield, Mass., and the remainder for Everett and Lynn, Mass. The Worthington Pump & Machinery Corporation wants several hundred tons for its Holyoke, Mass., plant.

Competition is keen and complicated by the use of the waterways for shipment. Alabama iron ranges from $17 to $18, delivered alongside in New York harbor, while Buffalo iron is offered alongside at $18, with silicon differentials waived up to No. 1X in some instances. Buffalo iron for rail delivery is quoted at $16, furnace, while eastern Pennsylvania iron for shipment into this district ranges from $17.50 to $18, furnace.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91
*Buff. No. 2, del'd east. N. J.	19.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	$18.89 to 19.39
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	18.89 to 19.89

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Reinforcing Bars.—Awards of more than 100 tons each total 2115 tons, although no single letting exceeded 425 tons. Small-lot business is holding up well, and some distributers find that their total bookings so far this year are virtually equal in terms of tonnage to those for the corresponding period in 1929. A number of large public projects are still pending, including 1285 tons for the Fort Lee bridge, New York. Prices are fairly steady, ranging from 1.75c. to 1.85c., Pittsburgh, for mill shipment, and from 2.40c. to 2.50c., f.o.b. cars, New York, on most warehouse tonnages.

Cast Iron Pipe.—Northern foundries are still operating at 70 to 75 per cent of capacity, but unless fall business begins to develop soon after Labor Day, curtailment of production will be necessary. Current buying of pressure pipe is generally small, the only recent sizable order having been about 3200 tons of large-sized pipe bought by the Public Works Engineering Co., New York, from three Southern makers. Prices are fairly well maintained at $36 to $37 a ton, f.o.b. Northern foundry, with the trend of quotations toward the lower price.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $38.90 to $39.90; 4-in. and 5-in., $41.90 to $42.90; 3-in., $48.90 to $49.90. Class A and gas pipe, $3 extra.

Finished Steel.—Except for better order from some manufacturers whose inventories have been permitted to drop very low, there is no sign of improvement in steel business, and these replenishment specifications are not sufficiently numerous to indicate any trend toward more liberal steel buying generally.

Prices are fairly steady on those products which are being taken in small lots. On structural material, prices are said to be "all over the map," each project being a law unto itself. On plates, 1.70c., Coatesville, for shipment from Eastern mills is now sufficiently general on attractive tonnages to be recognized in the price range. Cold-rolled strip steel, one of the most depressed of all finished steel products, is obtainable in carload lots at 2.35c., Pittsburgh or Cleveland, despite efforts of some mills to hold at a minimum of 2.45c., which is to be had on small lots. Sheet and hot-rolled strip prices are steadier than they have been. Merchant steel bars seem to be holding at 1.65c., Pittsburgh.

Warehouse Business.—Fabricating shops are beginning to buy more shapes from jobbers, but the tonnage of orders is still small. Demand for black and blue annealed sheets is light, and concessions are not uncommon on these grades. There is a fair demand for galvanized, with 4.25c. a lb., base, generally maintained, except for an occasional concession of $1 or $2 a ton.

Coke.—Demand for furnace grade has steadily diminished and, despite curtailment of production by operators, prices show continued weakness. The usual quotations are $2.50 to $2.60 a net ton, Connellsville, but a desirable order for 200 tons or more would bring a quotation of less than $2.50. Foundry coke prices are unchanged, as follows:

Special brands of beehive foundry coke, $4.85 a net ton, ovens, or $8.56 delivered to northern New Jersey, Jersey City and Newark, and $9.44 to New York and Brooklyn; by-product foundry coke, $9 to $9.40, Newark or Jersey City; $10.06, New York or Brooklyn.

Old Material.—Brokers report that only a small supply of scrap is obtainable at the present level of prices, and they show no inclination to sell with the expectation of filling their orders at the present market. Scrap consumers, however, show no interest in buying. While some No. 1 heavy melting steel is being bought at $12.50 a ton, delivered eastern Pennsylvania, $10, New York, equivalent to $13.50, eastern Pennsylvania, is being paid for shipment to Buffalo, and $15, delivered Pittsburgh district, or $9.70, New York, is being offered by Pittsburgh brokers. Specification pipe is off 50c. a ton to $11, delivered Lebanon, Pa., on recent purchases by brokers.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$9.00 to $10.00
Heavy melting steel (yard)	5.75 to 6.25
No. 1 hvy. breakable cast	7.75 to 8.50
Stove plate (steel works)	6.00 to 6.50
Locomotive grate bars	6.00 to 6.50
Machine shop turnings	5.00 to 5.25
Short shoveling turnings	4.50 to 5.00
Cast borings (blast fur. or steel works)	4.50 to 5.00
Mixed borings and turnings	5.00
Steel car axles	17.00
Iron car axles	19.00 to 19.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)	7.25
Forge fire	7.50
No. 1 railroad wrought	10.00 to 10.50
No. 1 yard wrought, long	9.00 to 9.50
Rails for rolling	9.50 to 10.00
Stove plate (foundry)	6.50
Malleable cast (railroad)	10.50 to 11.00
Cast borings (chemical)	8.50 to 9.00

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	$14.00
No. 1 hvy. cast (columns, bldg. materials, etc.); cupola size	12.00
No. 2 cast (radiators, cast boilers, etc.)	11.50

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars, small shapes	3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Blue ann'l'd sheets (No. 10)	3.25c. to 3.40c.
Black sheets (No. 24*)	3.65c. to 3.90c.
Galvanized sheets (No. 24*)	4.25c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	65
1 x 30 in. and smaller	65
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65
¾ x 20 in. and smaller	65

Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

PHILADELPHIA

Steel Mill Operations Low—Sheet Prices Still Shaded

PHILADELPHIA, Aug. 5.—Plate, shape and bar prices show no further recession, despite lack of improvement in the tonnage on mill books, but sheet quotations, especially on galvanized, are being shaded whenever desirable business is offered.

Steel mill operations in eastern Pennsylvania still range from about 45 to 55 per cent of rated capacity. Fabricating shops are moderately well engaged. Pipe shops are bidding on a fabricated pipe line for the city of Philadelphia, which will require 455 tons of plates.

Pig Iron.—Sales of foundry iron are still generally limited to small lots, with quotations ranging from $18.50 to $19 a ton, f.o.b. eastern Pennsylvania furnace. Southern foundry iron is still being shipped to consumers in this district at $12.50 a ton, f.o.b. Birmingham, but the pressure by Southern producers to sell in the North appears to have relaxed somewhat. Indian pig iron continues to be used by eastern Pennsylvania consumers and a substantial tonnage has been imported this year, the total promising to exceed that of 1928 or 1929. Users of basic iron have sufficient tonnage for present requirements.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$19.26 to $19.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	19.76 to 20.26
East. Pa. No. 1X	20.26 to 20.76
Basic (del'd east. Pa.)	18.25 to 18.50
Malleable	21.25
Stand. low phos. (f.o.b. east. Pa. furnace)	24.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Bars.—Demand is still small, and the price is unchanged at 1.65c. a lb., Pittsburgh, or 1.94c., delivered Philadelphia.

Reinforcing Bars.—Most of the projects in the market at present are small. A sewer for Upper Darby, Pa., requiring about 800 tons of reinforcing bars, has been postponed by a taxpayer's suit. Billet steel bars are quoted at 1.75c. to 1.85c., Pittsburgh, or 2.04c. to 2.14c., delivered Philadelphia, with the extra for cutting to length usually omitted. Rail steel bars are 1.60c. to 1.65c. a lb., Franklin, Pa., or 1.89c. to 1.94c., delivered Philadelphia.

Shapes.—Although there has been no appreciable increase in the tonnage of business on mill books, despite a more active fabricated steel market for some weeks, prices are beginning to show some stability. Desirable business is usually quoted at 1.60c. a lb., f.o.b. nearest mill to consumer, or 1.66c., delivered Philadelphia, with less desirable specifications ranging up to 1.70c., mill, or 1.76c., delivered Philadelphia.

Plates.—Business has not improved, but a sufficient tonnage is being booked to maintain operations of mills at from 45 to 50 per cent. Prices are 1.75c. a lb., f.o.b. Coatesville, Pa., or 1.85½c., delivered Philadelphia, with concessions of $1 a ton usually offered on the larger orders. A Torresdale, Pa., pipe line for the city of Philadelphia will require 455 tons of plates for pipe 11 ft. in diameter.

Sheets.—While consumers of sheets are either increasing operating rates slightly, or maintaining their former production schedules, prices lack firmness, and in the case of galvanized sheets show a recession of $1 a ton on recent business. Galvanized sheets are quoted at 3.05c. to 3.10c. a lb., Pittsburgh, or 3.34c. to 3.39c., delivered Philadelphia, and the lower range of the market has been shaded on desirable business another $1 a ton. Black sheets are quoted at 2.45c., Pittsburgh, or 2.74c., delivered Philadelphia, and on desirable orders this has been occasionally shaded $1 a ton. Blue annealed sheets are quoted at 2.15c. a lb., Pittsburgh, or 2.44c., Philadelphia, for No. 13 gage and blue annealed plates at 2c., Pittsburgh, or 2.29c., Philadelphia, for No. 10 gage. On both blue annealed sheets and plates, concessions of $1 to $2 a ton are not uncommon on medium-sized orders.

Imports.—In the week ended Aug. 2, arrivals at this port consisted of 561 tons of chrome ore from British South Africa, 2738 tons of pig iron, of which 2689 tons was from British India and 49 tons from the Netherlands, 50 tons of spiegeleisen from the United Kingdom, 50 tons of ferrochrome from Sweden, 42 tons of structural shapes, 17 tons of steel bars and 3 tons of steel plates from Germany, 14 tons of structural shapes and 5 tons of hoop steel from Belgium, and 21 tons of hoop steel from the United Kingdom.

Old Material.—Shipments of scrap are going forward to eastern Pennsylvania consumers, on a restricted scale, with the exception of the mill at Claymont, Del., which continues out of the market. Few transactions are reported and prices are unchanged.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$12.50 to $13.00
No. 2 heavy melting steel	10.00 to 10.50
Heavy melting steel (yard)	10.00
No. 1 railroad wrought	15.00 to 15.50
Bundled sheets (for steel works)	9.50
Hydraulic compressed, new	11.00 to 11.50
Hydraulic compressed, old	9.50
Machine shop turnings (for steel works)	9.00
Heavy axle turnings (or equiv.)	11.50 to 12.00
Cast borings (for steel works and roll. mill)	8.75 to 9.00
Heavy breakable cast (for steel works)	11.50 to 12.00
Railroad grate bars	10.00
Stove plate (for steel works)	10.00
No. 1 low phos., hvy., 0.04% and under	20.00
Couplers and knuckles	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
No. 1 blast f'nace scrap	8.50
Wrot. iron and soft steel pipes and tubes (new specific.)	11.50 to 12.00
Shafting	18.00 to 18.50
Steel axles	21.00 to 21.50
No. 1 forge fire	12.00
Cast iron carwheels	14.50 to 15.00
No. 1 cast	13.00 to 13.50
Cast borings (for chem. plant)	13.50 to 14.00
Steel rails for rolling	13.50 to 14.00

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.60c.
Structural shapes	2.60c.
Soft steel bars, small shapes, iron bars (except bands)	2.70c.
Reinforc. steel bars, sq., twisted and deform.	2.60c. to 2.70c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.25c.
Steel bands, No. 12 to ⅛-in. inclus.	3.00c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.70c.
†Galvanized sheets (No. 24)	4.25c.
Light plates, blue annealed (No. 10)	3.15c.
Blue ann'l'd sheets (No. 13)	3.30c.
Diam. pat. floor plates, ¼-in.	5.30c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Republic Steel Wins Suit Involving Pipe Process

Control of its process for the electric welding of steel pipe has been won by the Republic Steel Corporation in a verdict handed down in the United States District Court in Brooklyn. At the same time the court reaffirmed the validity of the Johnston process for continuous electric welding owned by the company.

The court decision follows the start of production recently of the first unit of Republic's new $8,000,000 electric welding pipe mill at Youngstown. The case was a patent suit brought by Steel & Tube, Inc., a subsidiary of the Republic Steel Corporation, against the S. Jackson Tube, Inc., of Brooklyn. The case not only involved the Johnston product and process patents, but also the patent on an apparatus for smoothing out the welding of tubes made in continuous welding machines. This equipment, which was invented by Harry Belmont, an employee of the Republic Steel Corporation, is an essential part of the electric pipe welding process.

CLEVELAND

Ingot Output Down to 44 Per Cent and Steel Orders Show No Gain

CLEVELAND, Aug. 5.—Most of the companies in this district which are dependent on the automobile industry for much of their business have felt little impetus from the resumption of work by Detroit automobile manufacturers. It is true that in many metal-working plants employees have taken up their tools again after a shutdown averaging two weeks or longer, but it is too early to determine the rate at which operations will be carried on. Whether these plants will be able to maintain schedules of two, three or five days a week will not be known until the needs of their customers become more clearly defined.

Some parts makers supplying the Ford Motor Co. have benefited from the renewal of Ford production, but in general the iron and steel industry has gained little, if any, in specifications and orders either from the automobile industry or other consuming channels. If automobile output points materially upward during August, iron and steel bookings from that source will naturally improve as the month progresses.

Meanwhile, steel plant operations in this immediate district have been further reduced by the closing down of two open-hearth furnaces, thus leaving production this week at 44 per cent of ingot capacity, against 50 per cent a week ago and 58 per cent on July 22, a loss of 14 points in two weeks.

District steel offices report that the flow of business has been very irregular, with two or three days of fairly good tonnage, followed by a similar period during which orders fall considerably below the normal level. While demand for bars has been light, prices have been relatively stronger than those on plates and structural shapes.

The structural market is at low ebb, with chief interest concentrated on the Central Lorain bridge, Cleveland, requiring 11,000 tons of steel, the award of which probably will be made this week. Fabricating shops in this district and in southern Michigan are reported to be badly in need of work.

The Wheeling & Lake Erie has bought 1400 tons of rails and also a round lot of track fastenings.

Sentiment in the trade is mixed, although the majority opinion is that a gradual improvement in business should be discernible by the latter part of August or early in September.

Pig Iron.—Resumption of operations by several large automobile plants has had the effect of increasing slightly shipments of pig iron to automobile foundries. The only large sale was 1000 to 2000 tons of Northern foundry and malleable to a Barberton, Ohio, user. Although inquiries have not appeared in sizable volume, they total perhaps 5000 to 6000 tons.

The fact that important melters are beginning to ask about prices informally is considered hopeful by the trade. Evidently many buyers are of the opinion that they will not be able to purchase iron at less than the present figures and therefore are contemplating placing orders. Nevertheless, the rank and file are content to take just enough tonnage to maintain current small-scale operations, preferring to await developments in the business situation before making major commitments. So far as prices are concerned, producers are holding firmly to $18 for local delivery. However, concessions in outside competitive territories are general, with quotations under $17, Cleveland furnace, being made at distant points in southern Ohio and Indiana. In Michigan, Northern foundry is being sold at $18.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25		$18.00
S'th'n fdy., sil. 1.75 to 2.25	$18.51 to	19.51
Malleable		18.00
Ohio silvery, 8 per cent	25.50 to	26.50
Basic Valley furnace		18.50
Stand. low phos., Valley	26.50 to	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; $3 from Jackson, Ohio; $6.01 from Birmingham.

Strip Steel.—Orders and specifications reflect the relatively small output in the automobile industry. Cold-rolled strip is being sold to large buyers at 2.35c., Cleveland, although small lots still are commanding 2.45c. Hot-rolled strip is steady at 1.65c., Pittsburgh, for stock wider than 6 in.

Wire Products.—Nails are being sold at $2.05 to $2.10 a keg. Manufacturers' wire is steady at 2.30c., Cleveland. Specifications and orders have lagged, with the slight prospect of a betterment in the next few weeks.

Bars, Shapes and Plates.—Bookings in heavy hot-rolled products have been spotty. Structural steel demand has been especially slow, with little new work of consequence coming out for bids. Tank and boiler shops are doing a fair business and forging makers are stepping up operations slightly. Prices are unchanged at 1.70c., Cleveland, for steel bars for outside shipment, 1.75c. for local delivery and 1.65c., Pittsburgh, for plates and shapes.

Sheets.—A northern Ohio sheet manufacturer is getting considerable tonnage from the Ford Motor Co. and therefore has increased its rolling schedules. Aside from this one case, however, there has been no substantial change in conditions. In some instances, stove makers are reported to be doing fairly well.

Warehouse Business.—Local jobbers have announced a downward revision of prices on a number of products, effective Aug. 1. Soft steel bars dropped $3 a ton to 2.85c. and plates and shapes $1 to 2.95c. Blue annealed sheets are down $3 a ton to 3.10c. with black and galvanized quoted at 3.60c. and 4.35c. respectively. July sales were considerably below those in June, and August promises little improvement.

Iron Ore.—Shipments from upper Lake ports in July totaled 8,586,649 tons, compared with 10,670,882 tons in the same month of 1929, a decline of 2,084,233 tons, or 19.5 per cent. For the first seven months of the year, shipments amounted to 24,324,-222 tons, against 32,910,820 tons for the corresponding period last year, a decrease of 8,586,598 tons, or 26 per cent.

Coke.—The Ashland By-Product Coke Co. has reduced its price on foundry coke to a level equivalent to $6 a ton, Connellsville. This is a drop of 50c. a ton.

Old Material.—Dealers are cleaning up old orders, but, aside from this activity, the market is virtually at a standstill. Steel mills are taking in only negligible tonnages on contract, and foundry operations are so low that there is little outlet for material in that direction. Meanwhile, the scrap trade is marking time until an upturn in steel demand stimulates buying by consumers. However, little change in the situation is expected until late this month or September. Prices are unchanged.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$11.75 to	$12.25
No. 2 heavy melting steel	11.25 to	11.50
Compressed sheet steel	12.25 to	12.50
Light bundled sheet stampings	11.00 to	11.50
Drop forge flashings	10.00 to	10.50
Machine shop turnings	8.00 to	8.50
Short shoveling turnings	9.75 to	10.25
No. 1 railroad wrought	13.00 to	13.50
No. 2 railroad wrought	14.00 to	14.50
No. 1 busheling	11.75 to	12.00
Pipes and flues	9.00 to	9.50
Steel axle turnings	12.50 to	13.00
Acid Open-Hearth Grades:		
Low phos., forging crops	17.75 to	18.00
Low phos., billet bloom and slab crops	18.50 to	18.75
Low phos., sheet bar crops	18.00 to	18.50
Low phos., plate scrap	18.00 to	18.50
Blast Furnace Grades:		
Cast iron borings	9.00 to	9.25
Mixed borings and short turnings	9.00 to	9.25
No. 2 busheling	8.75 to	9.00
Cupola Grades:		
No. 1 cast	15.00 to	15.50
Railroad grate bars	11.00 to	12.00
Stove plate	12.00 to	12.50
Rails under 3 ft.	18.50 to	19.50
Miscellaneous:		
Rails for rolling	16.25 to	16.50
Railroad malleable	16.00 to	16.50

ST. LOUIS

Pig Iron Producer Revises Prices on Contracts to Meet Current Levels

ST. LOUIS, Aug. 5.—The St. Louis Gas & Coke Corporation has revised prices for melters who held contracts for deliveries of pig iron at prices higher than now prevail. The result has been a substantial increase in specifications against these contracts, and shipments for July were in excess of June shipments, with the promise of further increases during August. The adjustment referred to had given rise to reports that the local maker was making prices below quotations. It was stated that it had not met the recent reduction of 50c. a ton of Chicago interests. The local maker has put one furnace out for repairs. New business during the week was light.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$18.00 to $18.50
Malleable, f.o.b. Granite City	18.00 to 18.50
N'th'n No. 2 fdy., deliv'd St. Louis	19.66
Southern No. 2 fdy., deliv'd	16.42
Northern malleable, deliv'd	19.66
Northern basic, deliv'd	19.66

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Steel.—The two bright spots in the finished trade, as reported by the Granite City Steel Co., are galvanized sheets, which show increased movement, especially from the South, which improvement is seasonal, and tin plate, the volume of which is holding up well. The construction lines are quiet, the only awards having been for additions to a storage plant for the Marquette Cement Mfg. Co., 175 tons, and four bridge spans for the Wabash Railway, 125 tons, which went to the McClintic-Marshall Co.

Warehouse business was slow during the early part of July, but picked up considerably during the latter part, resulting in a volume equal to June's business, but still 20 per cent less than July, 1929.

Old Material.—Although the scrap market is generally weak, with very little buying by the mills, dealers are paying higher prices for some items wanted by a large consumer in the district. These are railroad springs, wrought iron bars and transoms and steel angle bars, which are 50c. a ton higher than a week ago. The remainder of the list is unchanged. Dealers in some instances also are paying a premium on delay, by offering more for material from railroads which are known to be slow in making shipments. This is done because dealers do not want to lay material down in yards. Mills in the district are bargain hunting, and will buy material if they can get it at their prices.

Railroad lists: Pennsylvania, 30,880 tons; Baltimore & Ohio, 13,175 tons; Southern Pacific, 2825 tons; St. Louis-San Francisco, 22 carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	$11.00 to $11.50
No. 1 heavy melting or shoveling steel	10.75 to 11.25
No. 2 heavy melting or shoveling steel	10.00 to 10.50
No. 1 locomotive tires	13.00 to 13.50
Misc. stand.-sec. rails including frogs, switches and guards, cut apart	11.25 to 11.75
Railroad springs	13.75 to 14.25
Bundled sheets	7.50 to 8.00
No. 2 railroad wrought	10.75 to 11.25
No. 1 busheling	9.00 to 9.50
Cast iron borings and shoveling turnings	8.50 to 9.00
Iron rails	10.00 to 11.00
Rails for rolling	12.00 to 12.50
Machine shop turnings	6.00 to 6.50
Heavy turnings	8.50 to 9.00
Steel car axles	15.50 to 16.00
Iron car axles	24.50 to 25.00
Wrot. iron bars and trans.	14.50 to 15.00
No. 1 railroad wrought	8.00 to 8.50
Steel rails, less than 3 ft.	13.50 to 14.00
Steel angle bars	10.75 to 11.25
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	12.00 to 12.50
Railroad malleable	10.50 to 11.00
No. 1 railroad cast	11.00 to 11.50
Stove plate	9.50 to 10.00
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00
Agricult. malleable	10.00 to 10.50

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.60c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	4.90c.
Structural rivets	4.15c.
Boiler rivets	4.15c.

	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

BOSTON

Pig Iron Tonnages Under Negotiation—Scrap Prices Unchanged for Second Week

BOSTON, Aug. 5.—Pig iron sales contracted noticeably the past week, having been confined to car lots, mostly for prompt or nearby shipment, and in the aggregate were not more than 1500 tons. A fairly representative tonnage is under negotiation, however, including one lot of more than 1000 tons, which may be closed this week. In addition, some large consumers are sounding out the market for last quarter iron, and it is confidently believed that business will result before or around Aug. 15. The price situation is unchanged. Buffalo No. 2 plain, No. 2X or No. 1X iron is available at $16 a ton, on cars furnace, with furnaces east of Buffalo meeting this figure or cutting it slightly on round tonnage lots. Southern and eastern Pennsylvania irons are not much of a factor in New England these days.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25	$20.28
†Buffalo, sil. 2.25 to 2.75	$20.28 to 20.78
•Buffalo, sil. 1.75 to 2.25	20.91
•Buffalo, sil. 2.25 to 2.75	20.91 to 21.41
Va., sil. 1.75 to 2.25	25.21
Va., sil. 2.25 to 2.75	25.71
•Ala., sil. 1.75 to 2.25	22.61
•Ala., sil. 2.25 to 2.75	23.11
†Ala., sil. 1.75 to 2.25	18.75
†Ala., sil. 2.25 to 2.75	19.25

Freight rates: $4.91 all rail and $4.28 rail and water from Buffalo; $5.21 all rail from Virginia; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.

•All rail rate.

†Rail and water rate.

Structural Steel.—Lettings were small the past week, but indications are that business will be much better during the next fortnight, as it is intimated that several of the tonnages for bridges and buildings that have been pending for some time will be closed. Boston has taken bids on a bridge involving 200 tons of beams, which will be awarded shortly.

Cast Iron Pipe.—Aside from the 500 tons of 10-in., reported placed with R. D. Wood & Co. by Braintree, Mass., no sizable pipe tonnages were taken by foundries the past week. The Providence Gas Co., Providence, R. I., this week will close on more than 1000 tons of gas pipe, and the Boston Consolidated Gas Co. is feeling out the market on 2000 tons. Saugus, Mass., has closed bids on 200 tons of

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.	•3.55c. to 5.55c.
Squares and flats	•4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

•Including quantity differentials.

pipe, but has made no award, and Portsmouth, N. H., closed bids Aug. 4 on 145 tons of 8-in. and has made no award. Salem, Mass., is in the market for approximately 100 tons of 6-in. While openly quoted prices on pipe range from $35 to $37 a ton, f.o.b. foundry, on 6-in. and larger, the top price is obtained only on small tonnages from established customers. Where open competition exists, the price is usually $35 a ton or very close to that figure.

Reinforcing Bars.—Current bookings of reinforcing bars are small, and indications are that several tonnages that have been pending for some time will not be closed during August. Competition for business is keener than ever, with prices virtually at a no-profit level. Prices on billet steel bars made openly from local stock are: One to 5-ton lots 3.15c. a lb., base; six to 99 tons, 2.65c.; 100 tons and larger lots, 2.55c. Rail steel bars are 2.26½c. a lb., delivered common Boston freight rate points.

Warehouse Business.—Wire nails have been reduced 10c. per 100 lb. From stock they are $3.05 a keg, base, while on car lot shipments from mill they are $2.15, f.o.b. Pittsburgh, and on less than car lots, $2.40.

Old Material.—For the second consecutive week no change is noted in old material prices, which to brokers is an indication that the market is on bottom and that the next price movement will be upward. Current brokers' purchases are confined to scattered car lots, chiefly of No. 1 heavy melting steel, long bundled skeleton, steel mill borings, chemical borings and forge flashings. New England foundries continue to take textile and machinery cast moderately well, but are buying from local or nearby yards. It is said that a tonnage of rails will be loaded here late in August for export to Japan.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.50 to	$9.00
Scrap T rails	8.25 to	9.10
Scrap girder rails	7.50 to	8.10
No. 1 railroad wrought	7.00 to	7.50
Machine shop turnings	4.00 to	4.35
Cast iron borings (steel works and rolling mill)	4.00 to	4.35
Bundled skeleton, long	6.00 to	6.75
Forge flashings	7.25 to	7.60
Blast furnace borings and turnings	3.10 to	4.10
Forge scrap	6.10 to	6.50
Shafting	13.00 to	14.50
Steel car axles	16.00 to	17.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	6.50 to	7.10
Rails for rolling	9.00 to	9.25
Cast iron borings, chemical	9.00 to	9.25

Prices per gross ton deliv'd consumers' yards:

Textile cast	$11.50 to	$12.00
No. 1 machinery cast	13.50 to	14.00
No. 2 machinery cast	11.00 to	11.50
Stove plate	8.50 to	9.50
Railroad malleable	16.00 to	16.25

Great Lakes Steel Corporation, a unit of the National Steel Corporation, has completed the construction of an extensive railroad track system at its new mill at Ecorse, Mich., the yard system embodying 10 miles of trackage.

CANADA

Business Dull and Operations Are Being Curtailed, But Sentiment is Improving

TORONTO, Aug. 5.—While some interests associated with the iron and steel industry in this country are beginning to take a more optimistic view regarding future operations, business continues dull and curtailment is occurring in a number of plants.

The demand for merchant pig iron is featureless. While schedule releases are being made against old contracts, no new business for forward delivery is forthcoming. Melters are ordering for immediate needs and generally these are confined to small tonnages.

Within the past two weeks there has been a noticeable falling off in pig iron production in Canada, and there is possibility of further reductions in the near future. It is possible that at least two more furnaces may blow out soon. Some furnaces, however, are piling iron against future needs.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	22.50
Imported Iron, Montreal Warehouse	
Summerlee	$33.50
Carron	33.00

Structural Steel.—A number of contracts for building steel were placed during the week, but the majority of orders were for lots under 500 tons. The larger tonnage bookings are chiefly for bridge construction projects and are from Western Canada and Quebec. The Dominion Bridge Co., Lachine, Que., received a contract for 1000 tons for new shops at Montreal for the Canadian National Railways. The Department of Public Works, Quebec, Que., Ivan Vallee, engineer, proposes to build a bridge at Isle D'Orleans, Que., to cost $4,000,000, for which between 5000 and 8000 tons of steel will be required at the outset, with possibly considerable additional tonnage later.

Old Material.—Consumers and dealers are showing little interest in the market. What business is coming to hand is in small tonnage lots for immediate needs. Prices are unchanged.

Dealers' buying prices for old material:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$9.00	$8.00
Rails, scrap	10.00	8.00
No. 1 wrought	9.00	11.00
Machine shop turnings	6.00	5.00
Boiler plate	7.00	6.50
Heavy axle turnings	7.00	6.00
Cast borings	6.50	5.00
Steel borings	6.50	6.00
Wrought pipe	4.00	4.00
Steel axles	10.00	13.00
Axles, wrought iron	12.00	15.00
No. 1 machinery cast	....	12.00
Stove plate	....	10.00
Standard carwheels	....	10.50
Malleable	....	10.00
Per Net Ton		
No. 1 mach'ry cast	11.00	....
Stove plate	9.00	....
Standard carwheels	10.00	....
Malleable scrap	9.00	....

PACIFIC COAST

Ford Plant at Richmond, Cal., Taking 3800 Tons of Steel, Awarded

SAN FRANCISCO, Aug. 2 (*By Air Mail.*)—Sizable sales of iron and steel products on the Pacific Coast this week were restricted to a few projects. New inquiries are slow in coming forth. The outstanding award was 3800 tons of structural steel for the Ford plant at Richmond, Cal., placed with Herrick Iron Works. The price structure is not firm.

Only two reinforcing steel bar awards of more than 100 tons were reported. A bridge over the Shasta River in California went to an unnamed interest, as did a water system in Calgary, Canada, involving 215 tons. Pending business exceeds 10,000 tons, most of which has been pending for three weeks or more. Bids were opened on 112 tons for five bridges over the Salmon River in Oregon.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.40c.
Black sheets (No. 24)	4.35c.
Blue ann'l'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.00c.
Struc. rivets, ½-in. and larger	5.00c.
Com. wire nails, base per keg	3.35c.
Cement c't'd nails, 100 lb. keg	3.35c.

Pig Iron Prices Per Gross Ton at San Francisco

*Utah basic	$22.00 to $24.00
*Utah fdy., sil. 2.75 to 3.25	22.00 to 24.00
**Indian fdy., sil. 2.75 to 3.25	22.00 to 24.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Out-of-stock prices in the San Francisco district continue unchanged at 2.50c., base, on carload lots.

Bids have been opened on 2000 tons of plates for a 36 and 42-in. hammer-welded or electrically welded pipe for Los Angeles, the Western Pipe & Steel Co. being low bidder. Other sales and inquiries call for lots of less than 100 tons. Prices range from 2.15c. to 2.25c., c.i.f.

The Columbia steel plant secured 3000 tons of plain material for the 3800-ton Ford plant, the Herrick Iron Works to use 800 tons of foreign steel. The McClintic-Marshall Co. took 500 tons for a Kress store in Pasadena. The American Bridge Co. booked an unstated tonnage for bridges over various avenues in Los Angeles for the Santa Fe Railroad.

Other awards include 300 tons of sheet steel piling for the Fisher body plant in Seattle, placed with Jones & Laughlin Steel Corporation. On 400 tons for pier No. 1, San Francisco, bids will be opened Aug. 6. Shape prices have weakened for the first time in many months. While 2.25c., c.i.f., represents the general quotation, 2.15c. is being named on lots of 2000 tons and up.

Cast Iron Pipe.—Awards this week were confined to lots of less than 100 tons. Pending business exceeds 2400 tons. The only new inquiry of importance calls for 172 tons of 6 and 12-in. Class B pipe for Phoenix, Ariz.

Bids were opened Aug. 1 on 500 tons of rails for the municipal railroad in Seattle. No other inquiries for track material of importance are noted.

BIRMINGHAM

Steel Buying in July Showed Gain Over June—Pig Iron Dull

BIRMINGHAM, Aug. 5.—Sales continue at a low ebb, only a few small lots having been ordered for district delivery. A few foundries have started operations again on orders accumulated during temporary shutdowns. These foundries have meager stocks and in some cases the yards are bare. As a consequence specifications have increased, bringing a promise of improvement this week in shipments, which have been dragging for several weeks. However, it will require a considerable spurt in shipments to stop the steady addition of iron to already heavy furnace stocks. Pipe shops have been the only important consuming group to keep up commitments. Active furnaces total 14, the same as a week ago. Of this number, nine are on foundry iron, four on basic iron and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$14.00
No. 1 fdy., 2.25 to 2.75 sil.	14.50
Basic	14.00

Finished Steel.—Each week continues to bring a little gain in order books, with inquiries correspondingly better. New business in July showed an increase over that of June, though it was considerably less than that of July last year. Sheets, bars, railroad accessories and plates were largely responsible for the July increase. Last week's inquiries were up to the recent average, showing evidence that the improvement will carry into this month. Prices on galvanized sheets have been reduced $2 a ton, quotations now being 3.25c. to 3.30c. All other quotations are the same. The number of active open-hearths remains at 13.

Structural steel fabricators have had a fair week. The Ingalls Iron Works Co. booked 300 tons for a power house for the Southern Kraft Corporation, Panama City, Fla. The Virginia Bridge & Iron Co. received an order for 725 tons for a transit shed at the Alabama State Docks, Mobile. Plant operations range from 35 to 80 per cent of capacity, the smaller shops having the lower rates. Reinforcing bar lettings were light last week, showing a marked decline from the two weeks preceding.

Cast Iron Pipe.—The McWane Cast Iron Pipe Co. has received an order from the Southern Natural Gas Co. for 300,000 to 500,000 ft. of small diameter pipe and an order from Beaumont, Tex., for 25,000 ft. of 2-in. pipe. New orders of the United States Pipe & Foundry Co. include 3000 tons of 16 to 20-in. pipe for Hattiesburg, Miss., and 7800 ft. of 14-in. pipe for Greenville, Miss. The National Cast Iron Pipe Co. has booked a sizable order for the Public Works Engineering Corporation, Youngstown. The Central Foundry Co. received the contract for 200 tons for Shreveport, La. Vienna, Ga., will open bids Aug. 12 on 150 tons, and Kenner, La., will open bids Aug. 20 on a similar amount. Shops are maintaining operating schedules slightly under those of this time last year. Prices continue at $37 to $38 base, Birmingham, for 6-in. and larger sizes.

Coke.—Specifications on foundry coke contracts show a slight increase for the first time in weeks. Both production and shipments are at the low point of the year. The price remains at $5 a net ton, Birmingham.

Old Material.—Demand for steel scrap shows a little improvement; but trading is restricted to small orders. Cast grades are inactive. Only nominal values are represented in the unchanged quotations.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel		$12.00
Scrap steel rails	$12.50 to	13.00
Short shoveling turnings		9.00
Cast iron borings		9.00
Stove plate	11.50 to	12.00
Steel axles		20.00
Iron axles		23.00
No. 1 railroad wrought	10.00 to	10.50
Rails for rolling		14.50
No. 1 cast		13.00
Tramcar wheels		12.50
Cast iron carwheels	13.00 to	13.50
Cast iron borings, chem.	13.50 to	14.00

BUFFALO

Steel Plant Operations Decline Slightly—Buying of Pig Iron Subsides

BUFFALO, Aug. 5.—After 10 days of increased purchasing, the pig iron market has lost much of its recent activity. Neither in the East nor in the Buffalo district is there any new business of large size. Consumers who submitted inquiries for 6000 to 8000 tons bought only a small portion of that amount in the recent movement. Eight furnaces are producing iron here. July shipments were probably the smallest of the year. There is some inquiry for barge canal fleets to take iron to New York harbor points during the latter part of August.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$18.50
No. 2X fdy., sil. 2.25 to 2.75	19.00
No. 1 fdy., sil. 2.75 to 3.25	20.00
Malleable, sil. up to 2.25	19.00
Basic	17.50
Lake Superior charcoal	27.28

Finished Steel.—Another reduction in Buffalo district operation has taken place this week. Operation here is at 56 per cent of district capacity, compared with 59 per cent last week. An inquiry for about 3500 tons of structural steel is reported for the new Ford plant here. Purchase is expected to be made in Detroit this week. Another good-sized inquiry is for nearly 1000 tons of reinforcing bars for a Buffalo grain elevator. Demand for other forms of steel is about up to July average, although individual orders continue to be small, indicating a continuance of hand-to-mouth buying. Prices are highly competitive. The speed with which principal mills are able to make deliveries is an inducement to consumers to buy only such material as they know they can use soon after receipt. Preliminary estimates indicate operation at 55 to 60 per cent during August, taking the entire district into consideration.

Old Material.—There are reports here of additional purchases of No. 1 heavy melting steel, it being estimated that probably 10,000 tons has been bought by a leading consumer. These reports are that the price paid was nearer $13.50 a ton than the quotation of $13.25 first mentioned. Otherwise, the scrap market has been quiet, with the principal consumers uninterested in offerings. A small lot of stove plate has been purchased by a district consumer at a price said to be $10.40. There is no demand for turnings, borings or specialties. The low rate of blast furnace operation is expected to result in a very quiet market in scrap dur-

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.15c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Bands	3.50c.
Hoops	3.90c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.20
Black wire, base per 100 lb.	3.50

ing August. Yard operations continue to be much below the average for the season. Prices are nominal.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$12.75 to $13.25
No. 2 heavy melting scrap	11.00 to 11.50
Scrap rails	12.00 to 12.50
Hydraulic comp. sheets	11.25 to 12.25
Hand bundled sheets	9.00 to 9.50
Drop forge flashings	11.00 to 11.50
No. 1 busheling	11.25 to 12.50
Hvy. steel axle turnings	11.00 to 11.50
Machine shop turnings	6.00 to 7.00
No. 1 railroad wrought	10.00 to 10.50
Acid Open-Hearth Grades:	
Knuckles and couplers	15.00 to 15.50
Coil and leaf springs	15.00 to 15.50
Rolled steel wheels	15.00 to 15.50
Low phos. billet and bloom ends	16.50 to 17.00
Electric Furnace Grades:	
Short shov. steel turnings	10.50 to 10.75
Blast Furnace Grades:	
Short mixed borings and turnings	9.00 to 9.50
Cast iron borings	9.00 to 9.50
No. 2 busheling	7.00
Rolling Mill Grades:	
Steel car axles	16.00 to 16.50
Iron axles	19.00 to 19.50
Cupola Grades:	
No. 1 machinery cast	12.50 to 13.00
Stove plate	10.25 to 10.50
Locomotive grate bars	9.00 to 9.50
Steel rails, 3 ft. and under	16.00 to 16.50
Cast iron carwheels	13.50 to 14.00
Malleable Grades:	
Industrial	15.50 to 16.00
Railroad	15.50 to 16.00
Agricultural	15.50 to 16.00
Special Grades:	
Chemical borings	11.50 to 12.00

Program for Institute of Metals

The fall meeting of the Institute of Metals (British) will be held at Southampton, England, Sept. 9 to 12. The following technical program has been arranged.

"Pendulum Hardness Tests of Commercially Pure Metals," by D. A. N. Sandifer.

"Pressure Die-Cast Aluminum Alloy Test Pieces," by J. D. Grogan.

"Gas Removal and Grain Refinement of Aluminum Alloys," by W. Rosenhain, J. D. Grogan and T. H. Schofield.

"The Effects of Phosphorus on the Strength of Admiralty Gun Metal," by H. C. Dews.

"The Artificial Aging of Duralumin and Super-Duralumin," by K. L. Meissner.

"Lattice Distortion as a Factor in the Hardening of Metals," by W. L. Fink and K. R. Von Horn.

"A Study of the Relation between Macro- and Microstructure in Some Non-Ferrous Alloys," by Marie L. V. Gayler.

"The Diffusion of Aluminum into Iron," by N. W. Ageew and Olga I. Vher.

"A Note on the Constitution of the Cadmium-Zinc Alloys," by D. Stockdale.

"On the Determination of Crystallite Orientation," by Prof. G. Tammann.

"Rolled Gold: Its Origin and Development," by Ernest A. Smith.

"Heat Treatment, Ball-Hardness and Allotropy of Lead," by F. Hargreaves.

"The Effect of Two Years' Atmospheric Exposure on the Breaking Load of Hard-Drawn Non-Ferrous Wires," by J. C. Hudson.

"The Open-Air Corrosion of Copper. Part II.—The Mineralogical Relationships of Corrosion Products," by W. H. J. Vernon and L. Whitby.

"Silicon-Copper Alloys and Silicon-Manganese-Copper Alloys," by E. Voce.

"A New Silicon-Zinc-Copper Alloy," by E. Vaders.

YOUNGSTOWN

YOUNGSTOWN, Aug. 4.—Although the week holds promise of heavier tonnage releases on flat-rolled steel products because of resumption of activity in a number of automotive plants, demand thus far has not been sufficient to warrant any marked increase in production. Because production had been expected to be resumed in the Ford plants a week previously, orders from this source have generally been discounted and slight gains in demand from other sources are offset by reductions in the requirements of other consumers whose "vacation" periods are coming somewhat later.

It now seems that the more important steel-consuming industries in the northern Ohio and Michigan territory have completed or are approaching the ends of their midsummer inventory periods, but it will be another fortnight before the renewed consumptive power of these companies can be properly gaged. Although most of them are said to have had very low inventories before they closed down, it is not likely that orders accumulated in the meantime will be sufficient to necessitate any marked improvement in production with operations again under way.

The Valley steel industry, with its preponderance of automotive steel capacity, has been exceedingly depressed in the last three weeks. Only the heavy demands of the pipe mills have maintained open-hearth steel production at the 50 per cent rate which has prevailed, and the promised continuance of these requirements will form the basis for any improvement in the next two months. Sheet and strip production has been very light, but a slightly heavier demand for the common finishes of sheets, particularly black and galvanized, has been noticed in the last week. Production of plates has kept up because of skelp needs, but output of bars has fallen under 50 per cent and little improvement is reported. Demand for nails and wire has been light and tin plate production is tapering seasonably. Standard pipe, in line with other steel for building purposes, is depressed, and improvement is noted only in shipments of galvanized sheets and roofing to the South and Southwest.

With the exception of weakness in certain Eastern markets and characteristic shading in the Detroit territory, prices are holding. Steel company officials feel certain that the present levels will form the basis of general advances in the fall, but no hope is held out for an increase in billing prices before the first of the year. Second quarter earnings statements are emphasizing the unprofitable nature of recent business and mills are undoubtedly taking a firmer stand on quotations. Cynical observers point out that the present apparent stability is merely the result of a dearth of tonnage on which to quote.

Expected Expansion of Steel Orders Not Yet Apparent

Announcement by the Republic Steel Corporation of the booking of additional large pipe orders, with other awards pending, will mean employment of large groups of men on a more regular basis.

Republic Steel's total bookings in July were larger than in June, notwithstanding the Independence Day suspension and curtailed buying by the automobile industry. The company reports a steady tin plate business and receipt of important pipe orders. The Southern Natural Gas Co. of Alabama placed orders for 60 miles of 12-in. pipe with Republic, while 58 miles of tubing is to be shipped to the Southern Mississippi Valley for gas lines.

On Wednesday of this week, Republic is scheduled to make the first shipment of cold-rolled strip steel to the Ford Motor Co. plants since the Ford suspension. This is the beginning of other shipments of strips and sheets which will be made to Ford, whose plants resumed Aug. 4.

The market on primary materials remains stagnant. Shipments of pig iron are slightly heavier than they were early in July, but consumers still show reluctance to cover future needs. Inquiry is lacking and the competition of Cleveland furnaces has narrowed the territory in which Valley producers are able to secure the quoted market prices. With the blowing out of the Struthers furnace, only two merchant stacks are in blast in the Valleys and one of them is operated by a steel company. Reduced production is also emphasized by the fact that both of these stacks are the regular sources of supply for the two ingot mold foundries in the district. In spite of this, producers' stocks of iron are by no means large. On current small-lot sales in the immediate area foundry iron is holding at $18, Valley furnace, and malleable and Bessemer at $18.50. Basic is nominally quoted at $18, but the market has not been tested recently.

Scrap is very dull, but dealers are unwilling to sell heavy melting steel or hydraulic compressed sheets under the $15 level, and it is likely that purchase of substantial tonnage would develop prices 25c. to 50c. higher.

John H. Neafie, formerly associated with George H. Fanning, under the name of Neafie & Fanning, 50 Church Street, New York, has acquired Mr. Fanning's interest in the partnership and will continue under his own name to represent the Fate-Root-Heath Co., in New York and New England, with larger headquarters at 115 Broad Street, New York.

CINCINNATI

Demand for Pig Iron, Finished Steel and Scrap Extremely Dull

CINCINNATI, Aug. 5.—The demand for pig iron in this district in the last week was slightly under that of the preceding week. District furnace representatives report total sales of 1650 tons. The only feature of the market is the wide inquiry from small buyers of iron. Prices are being affected in individual cases by the fact that the present is a buyers' market. A Southern furnace sold 300 tons of Southern foundry iron in northern Indiana and 150 tons in central Ohio. The only inquiry is from the Marmon Motor Car Co., Indianapolis, for 500 to 1000 tons of Northern foundry iron.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89 to $21.39
Ala. fdy., sil. 1.75 to 2.25	16.19 to 17.69
Ala. fdy., sil. 2.25 to 2.75	17.19 to 18.19
Tenn. fdy., sil. 1.75 to 2.25	17.19 to 17.69
S'th'n Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Steel.—Demand for sheets in this district is very slow. The leading maker reports that bookings last week were at about 35 per cent of capacity and production was on a par with demand. Another mill in this district shut down last Wednesday for 10 days. The character of the demand remains the same, with culvert manufacturers leading in new orders. The absence of a fair demand for galvanized sheets is an unusual situation for this season.

Old Material.—Low rates of production in various branches of the metal-working industry are reflected in the small quantity of scrap available to dealers. This situation is forcing dealers to pay more for scrap to apply on contracts than the present schedules show.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.35c.
Cold-fin. rounds and hex. Squares	3.80c. 4.30c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100 lb.	10.25
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$16.50
4-in.	34.50
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$11.25 to $11.75
Scrap rails for melting	11.75 to 12.25
Loose sheet clippings	7.75 to 8.25
Bundled sheets	9.75 to 10.25
Cast iron borings	7.75 to 8.25
Machine shop turnings	7.25 to 7.75
No. 1 busheling	9.50 to 10.00
No. 2 busheling	6.00 to 6.50
Rails for rolling	13.00 to 13.50
No. 1 locomotive tires	13.50 to 14.00
No. 2 railroad wrought	11.25 to 11.75
Short rails	17.00 to 17.50
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.25 to 8.75
Stove plate	8.25 to 8.75
Brake shoes	8.25 to 8.75
Agricultural malleable	14.00 to 14.50
Railroad malleable	15.00 to 15.50

Bethlehem Earned $1.86 a Share

President Grace Looks for a Slow Improvement in Business in Coming Months

NET earnings of the Bethlehem Steel Corporation for the second quarter were equal to $1.86 a share on the 3,200,000 shares of common stock now outstanding, which, with the $2.60 earned in the first quarter, makes a total for the six months of $4.46. Earnings in the second quarter of 1929 were equal to $5.33 a share on 1,880,000 shares, the average number outstanding in that period.

Operations during the second quarter averaged 69.3 per cent of capacity, compared with 80.8 per cent in the first quarter and 100.6 per cent during the second quarter of 1929. Current operations, it was reported, are at the rate of 55 per cent.

Orders on hand on June 30 were valued at $59,906,772, compared with $73,333,010 at the end of the previous quarter and $56,829,800 on June 30, 1929.

In answer to questions after the directors' meeting, President Eugene G. Grace said there was every indication that the steel industry touched bottom early in June and that "things look a little better," although he added that the gain in orders was very slight.

"I do believe," he added, "that we have seen the worst in demand and prices. Normally, we get a seasonal pickup in August and September."

Average billing prices in the second quarter were $1.49 a ton less than the first quarter average, Mr. Grace said.

Bethlehem put on several open-hearth furnaces last week, but operations are being kept in strict conformity with current requirements of customers, and there is no stocking of steel.

Asked regarding the wage situation, Mr. Grace said there had been no reductions in Bethlehem plants and none is contemplated. He said that the Bethlehem workers are contributing their part in the present situation by accepting part-time employment, which he estimated was giving the men about 60 to 65 per cent of their normal weekly earnings. Last year's average per man was $1,942.

Other Financial Reports

National Steel Corporation and subsidiaries, Pittsburgh, had net income in the first six months of 1930 of $6,102,103, equivalent after all charges to $2.89 a share on common stock outstanding during the period. Although no statement was issued for the first half of 1929, the above earnings are approximately equal to those of the 1929 period.

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Inland Steel Co. reports net profits for the second quarter of $2,620,299, compared with $2,721,317 in the first quarter. Regular quarterly dividend of $1 a share on the common was declared.

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Crucible Steel Co. of America had net earnings of $2,317.772 in the first six months of 1930. Net profits were sufficient to cover dividends on both preferred and common stocks. H. S. Wilkinson, chairman, in commenting on business conditions, said that inventories in the hands of Crucible's customers are very low. He said that improved conditions are anticipated, with a larger volume of business in the last half of the year.

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Newton Steel Co., Youngstown, had net profit in the June quarter of $40,983, against $287,581 in the preceding quarter, and $799,928 in the June 1929 quarter.

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Wheeling Steel Corporation, Wheeling, W. Va., had net profits available for dividends in the six months ended June 30 of $2,351,581, compared with $4,137,538 in the corresponding 1929 period. Second quarter profits amounted to $1,098,356, compared with $2,342,294 in the second quarter of 1929. After deducting dividends on preferred A and B and common stock, surplus stood at $17,211,749 on June 30, 1930.

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Mesta Machine Co., Pittsburgh, in the six months ended June 30, had net income after depreciation and Federal taxes of approximately $1,271,000, equivalent to $2 a share on the 600,000 shares of common stock outstanding. According to H. F. Wahr, president, net profit for the entire year should approximate $4 a share on the common stock. New business is coming in satisfactorily, and unfilled orders as of June 30 total $5,286,000.

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A. M. Byers Co. had net profit in the quarter ended June 30 of $263,612, equivalent to 61c. a share on common stock. This compares with $331,501, or 81c. a share in the preceding quarter, and with $530,119, or $1.59 a share in the second quarter of 1929.

Non-Ferrous Metal Markets

Copper Quiet, Firm—Tin Steady—Lead Higher—Zinc Lower

NEW YORK, Aug. 5.

Copper.—Following the heavy purchases in July, the market has turned quiet. Some copper is being sold each day for both domestic and foreign consumption, but the volume is small. Producers generally are not seeking orders and are particular as to the quantity and destination of what they do sell. An interesting feature is the fact that some sellers of scrap copper and also some refiners of secondary metal are attempting to buy virgin metal, largely as a speculative proposition. They are reported to be having very little success. There are some cases, however, where the scarcity of scrap and other grades of copper is causing some users to buy virgin metal instead. Sales are confined entirely to October as the furthest delivery. There are inquiries for metal for November-December delivery, 11.25c. being offered, but very little success in obtaining it is in evidence.

It is reliably estimated that the total sales of copper for July were about 450,000,000 lb., of which approximately 150,000,000 lb. was for export. Prices are very firm, with electrolytic copper quoted at 11c., delivered in the Connecticut Valley, and with the quotation of Copper Exporters, Inc., at 11.30c., c.i.f., usual European ports. Lake copper is quoted at 11c. to 11.12½c., delivered.

Copper Averages.—The average price of Lake copper for July, based on daily quotations in THE IRON AGE, was 11.51½c., delivered. The price of electrolytic copper was 11.02c., refinery, or 11.27c., delivered in the Connecticut Valley.

Tin.—In a quiet week there has been some buying of tin each day, but the volume has not been large. The bank holiday in London yesterday added to the dullness. The statistics for July show a decrease in the world's visible supply whereas an increase was expected. The decrease for the month was 661 tons, bringing the total to 41,950 tons, which, however, is very large. American deliveries in July were greater than expected at 6130 tons. This is due largely to the fact that late in July there were fairly large sales for nearby tin, which presumably went into stocks. Large consumers apparently figured that, with tin as cheap as it is, it was good business to buy it, store it and finance it themselves.

THIS WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Aug. 5	Aug. 4	Aug. 2	Aug. 1	July 31	July 30
Lake copper, New York	11.12½	11.12½	11.12½	11.12½	11.12½	11.12½
Electrolytic copper, N. Y.*	10.75	10.75	10.75	10.75	10.75	10.75
Straits tin, spot, N. Y.	30.25	30.25	.....	30.12½	30.00	29.75
Zinc, East St. Louis	4.50	4.50	4.57½	4.57½	4.70	4.75
Zinc, New York	4.85	4.85	4.92½	4.92½	5.05	5.10
Lead, East St. Louis	5.35	5.35	5.25	5.25	5.15	5.15
Lead, New York	5.50	5.50	5.35	5.35	5.25	5.25

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Spot Straits tin today was quoted at 30.25c., New York. London prices today were a little higher than a week ago with spot standard quoted at £136 17s. 6d., future standard, at £138 12s. 6d., and spot Straits, at £138 2s. 6d. The Singapore price was £138 15s.

Lead.—Two advances in the last three or four days have been made by the American Smelting & Refining Co. The first was on Aug. 1 from 5.25c. to 5.35c., New York, and the second on Aug. 4, from 5.35c. to 5.50c. Corresponding price in the West is 5.35c. The cause of the advance is ascribed largely to the fact that some large consumers bought heavily. Demand today is quieter, with sales being made for September delivery.

Zinc.—The price of prime Western zinc has declined from 4.75c. to 4.50c., East St. Louis, during the week, because some large producers who had remained out of the market found it advisable to sell part of their product. Demand, however, was not sufficient to take up these offerings. Most producers now, however, have again withdrawn from the market.

There has been a reduction in the price of zinc ore. It was sold last week at $32, a decline of $1.50 from the highest price paid the week previous. Output was estimated last week at 8000 tons, with sales at 9250 tons, which is the largest total since early in June. Shipments were a little over 5500 tons, leaving the estimated ore surplus at about 30,910 tons.

Antimony. — Prices for Chinese metal have again advanced, due to the disturbances in that country. For spot and August the quotation is

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	17.75c.
Copper, hot rolled, base sizes	20.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes	23.00c.
Seamless Tubes—	
Brass	22.75c.
Copper	23.00c.
Brass Rods	16.12½c.
Brazed Brass Tubes	25.37½c.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	9.75c. to 10.25c.
Zinc sheets, open	10.75c. to 11.25c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	32.50c. to 33.50c.
Tin, bar	34.50c. to 35.50c.
Copper, Lake	12.75c.
Copper, electrolytic	12.50c.
Copper, casting	12.25c.
Zinc, slab	6.25c. to 7.25c.
Lead, American pig	6.50c. to 7.00c.
Lead, bar	8.50c. to 9.00c.
Antimony, Asiatic	10.00c. to 10.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	24.00c. to 25.00c.
Alum. ingots, No. 12 alloys	23.00c. to 24.00c.
Babbitt metal, commercial grade	25.00c. to 35.00c.
Solder, ½ and ½	22.50c. to 23.50c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	35.00c.
Tin, bar	37.00c.
Copper, Lake	12.25c.
Copper, electrolytic	12.25c.
Copper, casting	11.75c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig	6.25c. to 6.50c.
Lead, bar	8.75c.
Antimony, Asiatic	12.50c.
Babbitt metal, medium grade	17.50c.
Babbitt metal, high grade	38.00c.
Solder, ½ and ½	21.75c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (Prices quoted are nominal. Holders of metal are generally unwilling to part with stock at present low levels.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	9.00c.	10.00c.
Copper, hvy. and wire	8.75c.	9.75c.
Copper, light and bottoms	7.50c.	8.50c.
Brass, heavy	5.00c.	6.25c.
Brass, light	4.50c.	5.75c.
Hvy. machine composition	7.75c.	8.75c.
No. 1 yel. brass turnings	5.50c.	6.50c.
No. 1 red brass or compos. turnings	7.00c.	8.00c.
Lead, heavy	4.00c.	4.50c.
Lead, tea	2.75c.	3.50c.
Zinc	2.25c.	2.75c.
Sheet aluminum	7.50c.	9.50c.
Cast aluminum	7.00c.	9.00c.

8.25c., New York, duty paid. In the absence of cables today, futures are quoted nominally at about the same level.

Nickel.—With no change from the quotations which have prevailed so long, wholesale lots of ingot metal are quoted at 35c. a lb., with shot nickel at 36c. and electrolytic nickel in cathodes at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is unchanged at the published price of 22.90c. a lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Aug. 5.—Larger consumers have started to come into the market and prices for tin, antimony and lead have advanced. Zinc, after gaining strength early in the week, has dropped to 4.65c. a lb. The old metal market is a trifle more active.

Prices per lb., in carload lots: Lake copper, 11.125c. to 11.25c.; tin, 30.87½c.; lead, 5.25c.; zinc, 4.65c.; in less-than-carload lots, antimony, 8.35c. On old metals we quote copper wire, crucible shapes and copper clips, 9c.; copper bottoms, 7.25c. to 7.75c.; red brass, 7.25c. to 7.75c.; yellow brass, 5c. to 5.50c; pipe, 4c.; zinc, 1.50c. to 1.75c.; pewter, No 1, 15c.; tin-foil, 17.50c.; block tin, 22.50c.; aluminum, 7c. to 7.50c.; all being dealers' prices for less-than-carload lots.

Say Wages Will Not Come Down

Business Leaders, in Reply to Inquiry by Publication, Go on Record Against Reductions

TO obtain a cross-section view of what leading industrial executives in the United States are thinking regarding the question of wage reductions, *Printers' Ink*, a publication of advertising and sales promotion, recently telegraphed 25 heads of companies in varied lines of business and obtained 19 replies, most of which were straightforward in opposing wage cuts as a remedy for business depression. The views of several executives in steel and other metal-working lines are quoted from *Printers' Ink* as follows:

JAMES A. FARRELL, president, United States Steel Corporation: "Referring to your telegram of July 21, I think I can best answer you by quoting from my remarks at the May 9, 1930, meeting of the members of the American Iron and Steel Institute, which was held at the Hotel Commodore, New York City, as follows:

I heard a steel man say the other day, in fact, more than one recently, that wages should come down. I said, "Oh, no, wages in the steel industry are not coming down; you can make your mind up to that fact." I said, "If you are going out to sell your goods and eliminate your profit and expect to get it out of the men in the mills you are greatly mistaken." Then I said, "Make up your mind to one thing, use better judgment in your selling prices for your material and get rid of the idea that wages are going down." Because, Mr. Schwab, wages are not coming down in the steel industry. That would be just begging the question. We all know that just as soon as they go down, if they should, Mr. Customer gets it. It is like some shipowners who complain about the Panama Canal tolls; if the Panama Canal tolls were reduced or abolished the merchant abroad would get the benefit of the reduction and the taxpayers here would pay for it; certainly shipowners could not retain the saving.

A. R. ERSKINE, president, Studebaker Co.: "We have established a standardized working force which works varying hours daily according to production requirements. Have not even considered reducing wages or salaries and do not expect to be confronted with such an alternative."

Steel Industry Not Contemplating Reductions

CHARLES R. HOOK, president, American Rolling Mill Co.: "As far as we know, there have been no wage reductions made or contemplated in the steel industry. We, and as far as I know, other steel corporations, are of the same opinion that there should be no wage reductions. They would, in our opinion, retard and not stimulate business. As any man who has visited Middletown knows, the makers of Armco iron have a factory and a payroll that dominates that city. The citizens of this city place far more stock in what comes from the big boss than any amount of cheerful statements from distant places. There will be money for automobiles in Middletown."

HERBERT V. KOHLER, executive vice-president, Kohler Co.: "In the absence of Governor Walter J. Kohler I reply to your telegram of the 21st as follows: Kohler Co. is maintaining its organization and its wage scale."

Believes Cut Would Be Unfortunate

HOWARD COONLEY, president, Walworth Co.: "The Walworth Co. has no thought of reducing salaries or wages. In fact, under present conditions we believe this would be unfortunate, and we see nothing in the future to warrant such a step. On the other hand, I feel that I have no right to commit myself and my company over a long period of time. Although I believe that the severest point of the depression is over, I have no proofs to offer, and, therefore, I feel that to make a promise for the future would be unwise."

ARTHUR ROEDER, president, Colorado Fuel & Iron Co.: "No progressive management would cut wages or salaries merely because it might have an opportunity or excuse to do so. On the other hand, to say that cuts will not be made would be like declaring a dividend out of anticipated profits. Generally speaking, there is no justification for cutting wages without cutting salaries at the same time."

Reinforcing Steel

Lettings Total 6400 Tons—New Inquiries 2500 Tons

WITH 1250 tons for an industrial plant at Decatur, Ill., and other tonnages of moderate size, awards of reinforcing steel the past week were 6400 tons, against 4500 tons a week ago. New projects will take 2400 tons, the largest, 1000 tons, for State road work in Illinois. Awards follow:

BUFFALO, 400 tons, Ford assembling plant to an unnamed bidder.

GREENFIELD, MASS., 100 tons, New England Telephone & Telegraph Co. building, to Massachusetts company.

JAMAICA, N. Y., 400 tons, warehouse for Montgomery Ward & Co., Chicago, to Concrete Steel Co.

MAMARONECK, N. Y., 290 tons, cleaning chamber for Westchester County Sanitary Commission; placed by Woodcrest Construction Co., New York, with Joseph T. Ryerson & Son.

BROOKLYN, 300 tons, Post Office, to Truscon Steel Co.

BOUND BROOK, N. J., 300 tons, plant for Bakelite Corporation, to Truscon Steel Co.

BERGEN COUNTY, N. J., 400 tons, retaining walls, paving and bridges for State highways; placed by Anthony Cianciulli, general contractor, with Concrete Steel Co.

NORTHPORT, N. Y., 425 tons, Veterans' Hospital, to Concrete Steel Co.

HAMMOND, IND., 850 tons, State Line Generating Co., to Kalman Steel Co.

ROCKFORD, ILL., 350 tons, sewage treating plant, to Inland Steel Co.

DECATUR, ILL., 1250 tons, A. E. Staley Mfg. Co., to Calumet Steel Co.

SPRINGFIELD, ILL., 500 tons, paving, to Concrete Engineering Co.

CHICAGO, 155 tons, lions' house, to Concrete Engineering Co.

CHICAGO, 150 tons, Washington and Jane Smith Home, to Calumet Steel Co.

CHICAGO, 110 tons, Cosden Oil Co., to Olney J. Dean & Co.

SACRAMENTO, CAL., 182 tons, bridge over Shasta River in Siskiyou County, to an unnamed bidder.

CALGARY, CANADA, 215 tons, water system, to an unnamed bidder.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

CHESTER, PA., 100 tons, bridge at Fourth Street over Ridley Creek.

CHICAGO, tonnage being estimated, Senn High School.

CHICAGO, 500 tons, Monroe Street sewer; Underground Construction Co., general contractor.

CHICAGO, 100 tons, superstructure for Wabash Avenue viaduct.

CHICAGO HEIGHTS, ILL., 350 tons, grain elevator for Chesapeake & Ohio Railroad.

SPRINGFIELD, ILL., 1000 tons, State road; letting on Aug. 6.

COUNCIL BLUFFS, IOWA, 375 tons, addition to grain elevator for Chicago, Burlington & Quincy Railroad.

PORTLAND, ORE., 112 tons, five bridges on Salmon River; bids opened.

Fabricated Structural Steel

Awards of 22,000 Tons and New Projects of 14,000 Tons Smallest Since February

AWARDS of fabricated steel totaling about 22,000 tons and new projects of only about 14,000 tons were the smallest of any week since February, and compare with a weekly average for the year of 32,300 tons of inquiries and 32,600 tons of awards. Among the sizable awards were 5500 tons for an office building at Broad and Bridge Streets, New York, 3800 tons for a Ford plant at Richmond, Cal., and 2000 tons for a railroad bridge at Deepwater, Va. New business includes 5000 tons for a technical high school in Chicago and 2000 tons for the National Bank & Trust Co. building in Oklahoma City. Awards follow:

North Atlantic States

EVERETT, MASS., 150 tons, acid plant for Merrimac Chemical Co., to New England Structural Co.

BARRE, MASS., 105 tons, State water system intake, to Eastern Bridge & Structural Steel Co.

WEST BOYLSTON, MASS., 102 tons, State water system outlet, to Eastern Bridge & Structural Steel Co.

NEW YORK, 5500 tons, office building at Broad and Bridge Streets, to McClintic-Marshall Co.

NEW YORK, 500 tons, school No. 98 at Douglaston, Long Island, to an unnamed fabricator.

NEW YORK, 800 tons, loft building on East Forty-eighth Street, to Bethlehem Fabricators, Inc.

MAMARONECK, N. Y., 250 tons, sewage plant, to Guibert Steel Co.

BOUND BROOK, N. J., 2000 tons, factory building for Bakelite Co., to Levering & Garrigues.

STATE OF MARYLAND, 175 tons, highway bridges, to American Bridge Co.

The South

DEEPWATER, VA., 2000 tons, bridge for the Virginian Railway, to Virginia Bridge & Iron Co.

LOUISVILLE, KY., 2500 tons, steel transmission towers, to Bates Fabricated Steel Co., East Chicago.

PANAMA CITY, FLA., 300 tons, power house for Southern Kraft Corporation, to Ingalls Iron Works.

DALLAS, TEX., 150 tons, substation, to Nashville Bridge Co.

MOBILE, ALA., 725 tons, transit shed at Alabama State docks, to Virginia Bridge & Iron Co.

Central States

COLUMBUS, OHIO, 535 tons, Ohio State University building, to Pittsburgh Bridge & Iron Co.

CLEVELAND, 750 tons, Shaker Heights High School, to Massillon Bridge & Iron Works.

CHICAGO, BURLINGTON & QUINCY, 400 tons, bridge repairs, to Vierling Steel Works, Chicago.

ST. LOUIS, 300 tons, addition for Marquette Cement Mfg. Co., 175 tons, and four bridge spans for Wabash Railway, 125 tons, to McClintic-Marshall Co.

Western States

RICHMOND, CAL., 3800 tons, Ford plant, to Herrick Iron Works.

PASADENA, CAL., 500 tons, Kress Store, to McClintic-Marshall Co.

LOS ANGELES, unstated tonnage, bridges over Avenues 19, 20 and 26 for Santa Fe Railroad, to American Bridge Co.

SEATTLE, 300 tons, sheet steel piling for Fisher body plant, to Jones & Laughlin Steel Corporation.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

BROOKLINE, MASS., 200 tons, bank.

NEW YORK, unstated tonnage, infantry barracks at Fort Wadsworth.

NEW YORK, 5000 tons, Nurses' Home at York Avenue and Seventieth Street.

NEW YORK, 2000 tons, loft building on West Street.

NEW YORK, 150 tons, Medical Arts building at St. George, Staten Island.

NEW YORK, unstated tonnage, school and dormitory at St. George, Staten Island.

NEW YORK, unstated tonnage, alterations to American Savings Bank, 115 West Forty-second Street.

NEW YORK CENTRAL RAILROAD, 1000 tons; 800 tons for foundations to a garage at Eleventh Avenue and Sixty-second Street and 200 tons for closing street openings on Park Avenue.

EAST ORANGE, N. J., 200 tons, building for Muir's Department Store.

SUMMIT, N. J., 100 tons, telephone building.

CHESTER, PA., 400 tons, building for Chester *Times*.

POTTSTOWN, PA., 500 tons, gymnasium and memorial building for Hill School.

PHILADELPHIA, 4000 tons, bridge at Market Street and tunnel under river.

PHILADELPHIA, 455 tons of plates, fabricated pipe line 11 ft. in diameter at Torresdale.

The South

DALLAS, TEX., 400 tons, bridge for Dallas Traction Co.

Central States

CHICAGO, 260 tons, Kilmer School; A. F. Anderson low bidder.

CHICAGO, 5000 tons, Lane Technical High School; Reuter Brothers low bidders.

CHICAGO, 700 tons, track elevation for Chicago & North Western.

CHICAGO, 600 tons, printing plant for Chicago *Daily News*.

CHICAGO, BURLINGTON & QUINCY, 500 tons, bridge reinforcement.

Western States

OKLAHOMA CITY, 2000 tons, First National Bank & Trust Co.

LOS ANGELES, 2000 tons, plates, 36 and 42-in. welded steel pipe for city; Western Pipe & Steel Co. low bidder.

SAN FRANCISCO, 400 tons, Pier No. 1; bids August 6.

Railroad Equipment

Gulf Refining Co., which recently ordered 125 tank cars each from Petroleum Iron Works and General American Tank Car Corporation, has doubled both orders.

Inter-State Iron Co., has ordered 21 20-yd. air dump cars and 21 30-yd. air dump cars from Koppel Industrial Car & Equipment Co. This company is inquiring for three locomotives.

Great Northern has given Canton Car Co. an order for 150 hopper cars.

Anglo-Chilean Consolidated Nitrate Corporation has ordered 350 all-steel ore cars from Koppel Industrial Car & Equipment Co.

Canadian National has ordered 40 refrigerator cars, 200 to be built in shops of the railroad at Winnipeg, Man., and London, Ont., and 200 to be built by Eastern Car Co., New Glasgow, N. S.

Inventor of Mold for Engine Frame Awarded Damages

ST. LOUIS, Aug. 4.—The Commonwealth Steel Co., Granite City, Ill., and its president, C. H. Howard, are liable for damages for violation of a fiduciary relation with A. F. Howe, former employee of the company, inventor of a steel mold for casting locomotive and tender frames in one piece and sand mill improvements, which in recent years contributed greatly to the company's development, according to an opinion given last week by Judge Louis FitzHenry in United States District Court at Springfield, Ill. The damages, it is said, may exceed $1,000,000, and E. F. Allen, Quincy, Ill., master-in-chancery, has been instructed to begin hearings to fix the amount to be awarded Howe.

In 1910 Howe approached his immediate superior with plans for the one-piece locomotive tender casting, but was discouraged in his plans by the plant executive. He appealed, however, to Howard, president of the company, who permitted him to build an experimental mold in the shops. The successful demonstration of the mold was recorded as a "substantial event in the career of the company," according to the court. The company, which was said to have practically no sale value in 1904, had a valuation of $35,000,000 last year, and its annual business increased from $1,000,000 to $15,000,000, with plant force expanded from 400 to 4000 employees as result.

Howe was assisted in obtaining his patents by the company attorneys, but was prevailed upon to let the company take them over. Promise of satisfactory reward was made as soon as the officers were able to make estimate of the value of the invention. Howe made several efforts to have this part of the understanding fulfilled and in the meantime perfected a sand mill improvement, which was turned over to the company under a similar understanding.

Last year when a stockholders' committee was organized to handle the transfer of the stock to the General Steel Castings Corporation, which now has taken over majority control of the company, Howe insisted, through attorneys, that settlement be made, but the officials then stated that "they didn't remember having made any promises to pay Howe for his patents."

Judge FitzHenry ruled, however, that the Commonwealth company was owner of the shop rights in and to the patents, declaring that Howe was entitled to recover a reasonable value of the patents, or an accounting of earnings less value of shop rights.

Holidays Slow Up European Industry

Summer Slackness Intensified by Idle Days—Shipbuilding Output Low—Germans Increase Their Exports to Many Lands

(*By cablegram*)

LONDON, Aug. 5.

IRON and steel markets are under the influence of the holidays, and general idleness prevails. In Scotland 13 blast furnaces have been banked, leaving only twelve operating.

Tin plate markets are quiet and some large consumers are behind with their specifications. The mills generally are well sold. All are idle this week—the annual stop week.

Galvanized and black sheet markets are idle.

Clyde shipbuilding in July consisted of nine vessels launched, aggregating 31,800 tons, gross register. The low output was owing in part to the holidays. Work on hand in Scottish yards is 100,000 tons below that of three months ago and vacant berths are increasing.

Continental iron and steel factors here are idle, owing to the holidays. Considerable confusion still prevails over the semi-finished steel and the structural steel cartels, which are now in force and will so remain until the end of the year. German and Luxemburg members desire that the cartel offices be established in Luxemburg, instead of in Belgium and France, respectively.

The British Government is sending an economic mission to China and Japan to study the possibilities of developing British trade there, especially in textiles.

A Sheffield mission to South America is to visit Brazil, Uruguay, Argentina, Chile and Peru.

German Export to Argentina, Brazil and Chile Better and Belgian Orders from Soviet Union Are Increasing.

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Unfilled Orders of German United Steel Works 48 Per Cent Less Than Year Ago.

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Czechoslovakia's Export Trade Greatly Hampered by Low Water in Elbe and Oder Rivers.

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German Cable Makers Agree on Building Plant in Japan Because of High Tariff.

There are serious misgivings regarding the British position in international trade, and extension of these missions is probable, wherever British trade is especially threatened.

A high court has sanctioned the arrangement for amalgamation of the United Steel companies and the united strip and bar mills. The new company's capital stock will be £6,650,000 ($32,350,000).

A contract for railroad construction and equipment has been placed by the Turkish Government with the German combine, involving a value of £2,500,000 ($12,166,000). Payment will be spread over a period of years and the German Government guarantees the combine against loss.

French output in June included 849,000 (metric) tons of pig iron and 770,000 tons of raw steel. There were 147 blast furnaces operating at the end of June.

German Steel Export Trade Better

(*By Radio*)

BERLIN, GERMANY, Aug. 4.

GERMAN export trade with Argentina, Chile, Brazil and the Far East is increasing, but the domestic market is dull and unfilled tonnage on the books of the Vereinigte Stahlwerke A.G., Düsseldorf, is 48 per cent less than a year ago. The Stahlwerksverband, however, reports signs of improvement.

Belgian business with the U. S. S. R. is increasing considerably. Mills there are exporting steel bars at £4 10s. per ton (0.99c. a lb.), f.o.b. Antwerp.

While export trade has increased since the Continental Steel Cartel abolished control of prices on bars, bands and sheets, quotations have declined from 5 to 6 m. ($1.20 to $1.42) per ton.

Continental steel consumers are still inclined to delay buying, apparently expecting a further reduction of prices, but steel producers, including the interest in Düsseldorf, consider that the bottom has been reached and predict a general improvement in the fall.

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at $4.8665 (par)

British Prices f.o.b. United Kingdom Ports

Ferromanganese, export	£11	10s.				$55.95		
Billets, open-hearth	5	15	to	£6	5s.	27.98	to	$30.41
Black sheets, Japanese specifications	12	5				59.61		
Tin plate, per base box	0	18	to	0	18⅛	4.37	to	4.39
						Cents a Lb.		
Steel bars, open-hearth	7	15	to	8	5	1.69	to	1.79
Beams, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Channels, open-hearth	7	12½	to	8	12½	1.66	to	1.87
Angles, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Black sheets, No. 24 gage	9	10	to	9	15	2.06	to	2.12
Galvanized sheets, No. 24 gage	11	17½				2.57		

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£2	17s.	to	£3	0s.	$13.86	to	$14.60
Billets, Thomas	4	6	to	4	7	20.93	to	21.17
Wire rods, low C., No. 5 B.W.G.	6	2	to	6	4	29.69	to	30.19
Rails, light	6	0				29.20		
Black sheets, No. 31 gage, Japanese	11	5	to	12	12	54.68	to	58.32
						Cents a Lb.		
Steel bars, merchant	4	10	to	4	11	0.99	to	1.00
Steel bars, deformed	4	10	to	4	11	0.99	to	1.00
Beams, Thomas, British standard	4	19½	to	5	0½	1.10	to	1.11
Channels, Thomas, American sections	5	12	to	5	14	1.24	to	1.26
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	4	10				0.99		
Angles, Thomas, 3-in.	4	12½				1.02		
Hoop and strip steel over 6-in. base	5	1	to	5	2½	1.11	to	1.13
Wire, plain, No. 8 gage	6	0	to	6	12½	1.32	to	1.46
Wire, barbed, 4-pt. No. 12 B.W.G.	10	0	to	11	0	2.21	to	2.43
Wire nails, base	6	2½	to	6	12½	$1.35	to	$1.46
						a keg		

No Manganese Embargo without Facts

President's Statement That Political Considerations Will Not Govern Clears Situation

WASHINGTON, Aug. 5.—The drive against Russian imports has taken on such a sweeping character that it apparently was the cause of the President's statement that the United States does not propose to let its action be influenced by political considerations. The mere fact that the United States does not have diplomatic relations with the Soviet government, and that it is not in accord with the Soviet form of government, is to have nothing to do with the trade relations of the two countries.

The administration position was made known because it became apparent that the belief prevailed that political considerations might result in the shutting off of Russian imports. No such radical action was intended, of course, nor was it implied, though published statements have appeared which left the impression that certain officials of the Treasury Department had indicated such a move.

The effort of the American Manganese Producers' Association to have Russian manganese ore imports barred has been supported in a letter from Senator Oddie, of Nevada, to Assistant Secretary of the Treasury Seymour Lowman. Senator Oddie charged that the Russian ore is being dumped, and that it is being produced by convict and forced labor. The barring of the Russian imports, according to Senator Oddie, "will not only protect the large amount of capital invested in the American manganese industry but will result in greatly improved conditions for thousands of American miners. Since there are manganese deposits in 34 States of the Union, the benefits from an expanding manganese industry would be generally well distributed throughout the nation."

It is clear that, before declaring further embargoes, the Treasury Department intends to have the necessary evidence to support such action. It is declared there is as yet no evidence that Russian manganese ore is being dumped or being produced by convict labor. On the other hand, it has been stated that both situations may prevail but that proof must be obtained before action is taken. There is a serious doubt, however, that even if Russian imports were shut off it would help the so-called domestic industry, since it supplies not more than 5 per cent of the requirements of the steel industry. Nor is the labor required to produce Russian shipments to the United States held to be considerable.

The Russian shipments during the current year have averaged only about 12,000 tons a month and, while this represents about 47 per cent of total manganese imports, it is pointed out it does not involve a great deal of labor. Moreover, it is reported that American importers of Russian ore now have good-sized stocks and that shipments from that country promise to be unusually light for the next few months.

Czechoslovakian Exports Greatly Reduced

HAMBURG, GERMANY, July 21.—Czechoslovakian iron and steel exports to overseas markets have been greatly curtailed, as river traffic on the Elbe and Oder rivers has been temporarily discontinued because of the drought. Rail shipments to ports are but little used because of high freight rates.

Poland Quotes Low Prices on Railroad Equipment

HAMBURG, GERMANY, July 21.—Polish producers of locomotives, cars and track equipment are becoming keen competitors for export business. Recently Polish shops secured an order from Bulgaria for 20 locomotives built to German specifications and design, and for some time Poland has received all the orders from the Jugoslavian railroads for rails, underbidding the German, French and Czechoslovakian makers by about 20 per cent. It is noteworthy that the Polish mills are members of the International Rail Makers' Association.

German Cable Makers To Build in Japan

HAMBURG, GERMANY, July 21.—German cable makers, pursuing a policy of building plants in countries with high tariffs, have completed negotiations with the Japanese Government and will soon begin building a cable works in Japan. The first foreign plant established by German cable manufacturers was in Poland.

Price Control Cessation Affects Finishing Mills

DÜSSELDORF, GERMANY, July 22.—Finishing mills which buy semi-finished material may be at a serious disadvantage with price control on finished steel products abandoned by the Continental Steel Cartel and a selling syndicate for semi-finished steel and beams operating effectively. The United Kingdom is a good market for Continental sellers of semi-finished steel, but, with the possibility of a firm price quoted on semi-finished and an open and highly competitive market for finished products, certain mills may be forced to suspend. It has been suggested in some quarters that continuation of the present competition may bring the price of bars to the level of semi-finished material.

Lower Factory Workers' Earnings

Average weekly earnings in representative New York State factories, including all employees in both office and shop, are reported by the State Industrial Commissioner at $28.96 for May. This is the lowest such figure since the $28.79 of April, 1928. It compares with $29.45 for April, itself the lowest in 20 months, and with $30.03 a year earlier. The maximum, $30.47, was registered last September, since when the decline has been 5 per cent.

How Large Crucibles Are Made

(*Concluded from page* 350)

cial kiln for burning, or in certain instances, re-burned in the same kiln.

This burning is done under extremely strict temperature control, four thermocouples being located around the sides of the kiln and one in the crown in each of the crucible kilns (where temperature control is particularly essential). These thermocouples lead through a 16-point switch to a Brown indicating pyrometer, and readings of all active couples are taken at regular intervals. To aid in checking the burning, a Brown strip chart recording pyrometer is also used. This recorder may be connected to a thermocouple at any point, but ordinarily the one in the crown of the kiln is used, as this practice gives the best results.

Standard Curve Regulates Firing

With certain burns, a definite curve is plotted on the chart in advance of the firing and the men see to it that the chart record closely follows the plotted guide curve. These kilns are all coal-fired, but the men have been carefully trained as to methods and time of stoking, and consequently are able to keep their actual temperature curve in close relation to the desired schedule. As a result, there is exceptionally low breakage in the kilns, the crucibles have required strength and, consequently, long life in actual service. This comes as the direct result of, first, proper selection, proportioning and mixing of materials; second, correct design of ware; and third, burning the ware under pyrometer control. Temperature control is as important as proper clay blending.

Rail Steel Bar Association will hold a general meeting, Aug. 7 to 9, inclusive, at the Royal Connaught Hotel, Hamilton, Ont. The program is under the direction of officials of the Burlington Steel Co. of that city.

Machinery Markets and News of the Works

Amtorg Places Tool Orders

Some Machine Tool Builders Accept Business On Long Terms—General Business Dull

MACHINE tool builders who have done business with the Amtorg Trading Corporation, the buying representative of Soviet Russia, apparently have not become alarmed because of the recent agitation involving Amtorg's affairs in this country. Some have accepted orders, one at least amounting to $100,000, on credit terms more liberal than have ordinarily been granted. In some instances the Amtorg is asking for acceptance of four equal payments to be made three months apart, the first not falling due until three months after shipment. It is said that quite a few orders have been placed on this basis.

Interest in Amtorg business probably is enlivened by the fact that domestic buying is so dull. July was the low point in many years for a good many sellers. It is estimated that July sales were not better than 10 per cent of the best months of last year and about 40 per cent of the best month of this year. This proportion would not apply in all cases, but it is fairly representative of a good many.

Except that the poor month of July is out of the way and that the approach of September renews hopes of at least a moderate revival in machine tool buying, there is nothing in the business situation as it affects this particular industry to create a better outlook. However, the mere fact that a general recovery is believed to be nearer at hand contributes to a more hopeful feeling in the trade, which knows from experience that machine tool buying follows rather than precedes an upward business trend.

New York

NEW YORK, Aug. 5—Despite the recent agitation involving the affairs of the Amtorg Trading Corporation, that company has found it possible to place a number of machine tool orders in the past week, one at least as large as $100,000, on credit terms extending over 12 months. Amtorg in some instances is now demanding more liberal credit terms than heretofore and, in the absence of important orders from other sources, some machine tool builders are inclined to grant the terms. Amtorg has asked for terms calling for equal payments of 25 per cent, the first to be made three months after shipment and the others three months apart.

In domestic business there has been no improvement in this territory. July was the low point in years for many dealers and direct representatives. It has been estimated that in some cases July sales were about 40 per cent of those of the best month this year and about 10 per cent of the best monthly record last year.

Bell Telephone Laboratories, Inc., 463 West Street, New York, has acquired through American Telephone & Telegraph Co., 195 Broadway, parent organization, 200 acres in Murray Hill section, near New Providence, N. J., as site for new plant, for which plans will be drawn soon, to cost over $200,000 with equipment.

Moto-Meter Gauge & Equipment Corporation, 11 Wilbur Avenue, Long Island City, N. Y., manufacturer of ammeters, gages, spark plugs and other automobile equipment, is arranging for early removal of entire automotive division from local works to Toledo, Ohio, where plant will be housed in factory with W. G. Nagel Electric Co., 511 Hamilton Street, an affiliated organization. It is proposed to concentrate production of all automobile accessories at Toledo, including other subsidiaries.

Montgomery Ward & Co., Chicago Avenue and Larramie Street, Chicago, have plans for a multi-story branch for storage and distribution at Jamaica, L. I., to cost over $400,000 with equipment.

General Gas & Electric Corporation, 61 Broadway, New York, operating electric light and power utilities, has arranged for a note issue of $50,000,000, part of fund to be used for extensions and improvements. Company is now building a new hydro-electric generating plant on Saluda River, near Columbia, S. C., to be ready for service before close of year.

New York Central Railroad Co., 466 Lexington Avenue, New York, has awarded general contract to Aronberg-Fried Construction Co., 21 East Fortieth Street, for an electric control and distributing plant, to cost about $100,000 with equipment.

Lehigh Valley Railroad Co., 143 Liberty Street, New York, and Starrett Investing Co., 101 Park Avenue, associated, have awarded general contract to Starrett Brothers & Eken, Inc., last noted address, for a 15-story freight and industrial terminal on block bounded by Eleventh and Thirteenth Avenues, Twenty-sixth and Twenty-seventh Streets, to cost over $8,000,000. Elevating, conveying, loading and other mechanical-handling equipment will be installed. Russell G. Cory, 30 Church Street, is architect and engineer.

Abraham Baxter, plumbing equipment and supplies, care of De Rose & Cavalieri, 370 East 149th Street, New York, architects, has filed plans for a one-story plant, 100 x 100 ft., to cost over $100,000 with equipment.

Einson-Freeman Co., Inc., 511 East Seventy-second Street, New York, manufacturer of advertising signs, displays, etc., has leased four floors in building at Long Island City for a new plant, and will remove to new location and increase capacity.

Canada Dry Ginger Ale Co., Inc., 122 East Forty-second Street, New York, will install automatic bottling machinery, with conveyors, elevating and other equipment, in new bottling plant at Edmonton, Alta., to cost about $100,000.

Myers Plate Glass Co., 505 East Eighty-second Street, New York, has purchased former three-story plant of Borden's Farm Products Co., at 311-19 East 117th Street and will remodel for new storage and distributing plant, with cutting, trimming and other departments, including conveying and other mechanical-handling equipment. Present works will be removed to new location.

Consolidated Film Industries, Inc., Lemoine Avenue, Fort Lee, N. J., is asking bids on general contract for a one-story machine shop, 26 x 200 ft., and a one-story and basement storage and distributing building, 26 x 240 ft., to cost over $80,000 with equipment. Granville W. Dexter, 201 Main Street, Fort Lee, is architect.

J. C. Vlandren, 140 Market Street, Paterson, N. J., architect, will take bids in about a month for a two-story automobile service, repair and garage building, 90 x 140 ft., at Hawthorne, N. J., to cost about $100,000 with equipment.

Thomas J. Lee, Jr., 495 Lyons Avenue, Irvington, N. J., plumbing equipment and supplies, has leased building at 54-72 Woolsey Street, Irvington, for new branch storage and distributing plant, with pipe fitting and other departments.

Public Service Electric & Gas Co., Public Service Terminal, Newark, is planning enlargement of its power plant at Irvington Center, to cost over $75,000 with equipment.

North Jersey District Water Supply Commission, 24 Commerce Street, Newark, is asking bids until Aug. 19 for enameled steel tables, enameled steel storage cabinets and other equipment for water laboratory at Wanaque headworks. Morris R. Sherrerd is consulting engineer.

Eastern New Jersey Power Co., Asbury Park, N. J., has arranged bond issue of $3,140,000, part of fund to be used for expansion and improvements, including steel tower high-tension line near Matawan.

Max B. Miller & Co., New York, have awarded contract for filtration and clay storage buildings at Paulsboro, N. J., to Austin Co., involving an expenditure of $200,000.

New England

BOSTON, Aug. 4.—Machine tool dealers are negotiating with a number of prospects, but actual sales are few. An East Boston company has purchased two turret lathes, a Connecticut plant a high-production lathe, a Massachusetts manufacturer a radial drill, and the Boston school committee will buy a small amount of lathe equipment for the Brighton high school this week. New England machine tool builders in general report a slight improvement in inquiries and scattered sales from buyers in the Middle West and Southwest. The Pneumatic Drop Hammer Co. has placed five hammers with an Attleboro, Mass., company, two 400-lb. hammers with a Connecticut manufacturer and one 600-lb. and one 900-lb. hammers with a Toronto maker.

Demand for small tools while quiet is better than a month ago.

Edward La Croix, Van Buren, Me., will rebuild his lumber mill and machine shop recently destroyed by fire.

Worcester Transit Concrete, Inc., Worcester, Mass., will build a concrete mixing plant at Auburn, Mass. Conveying and miscellaneous equipment will be purchased.

Hubbard Engineering Co., Middletown, Conn., marine motors, has purchased car barns of former Berkshire Street Railway, Great Barrington, Mass., and will remodel for manufacturing.

Trumbull Electric Mfg. Co., Plainville, Conn., manufacturer of switches, switchboards, panel boards, etc., is considering new branch plant at Oakland, Cal., or vicinity, to cost over $100,000. John H. Trumbull, president, is now on Pacific Coast and will select site.

Aroostook Federation of Farmers, care of P. G. Sullivan, Caribou, Me., has acquired plant and property of Sandy Point Shipbuilding Corporation, Stockton Springs, Me., as site for new plant for manufacture of commercial fertilizers. Initial works will cost close to $150,000 with machinery and shipping pier.

Segal Lock & Hardware Co., 55 Ferris Street, Brooklyn, N. Y., is planning removal of its plant to Norwalk, Conn., where main production will be concentrated. Some time ago company acquired plant and business of Norwalk Lock Co., and will consolidate manufacture at Norwalk with that interest. Company is arranging for a new stock issue, part of proceeds to be used for expansion, purchase of company noted, etc.

Heppenstall Forge Co., Howard Avenue, Bridgeport, Conn., has awarded general contract to Hewlett Co., 886 Main Street, for one-story forge shop addition, 50 x 100 ft., to cost about $35,000 with equipment. Fletcher-Thompson, Inc., 542 Fairfield Avenue, is architect and engineer.

Merrimac Boiler Works, Lawrence, Mass., has purchased former mill of Walworth Brothers and will remodel for a new boiler and plate shop.

F. W. Webster Co., 340 Congress Street, Boston, manufacturer of typewriter equipment and supplies, has plans for new four-story plant, 100 x 200 ft., to cost over $160,000 with equipment. Densmore, Le Clear & Robbins, 31 St. James Avenue, Boston, are architects.

Carpenter Mfg. Co., Norwich, Conn., manufacturer of hardware specialties, picture wire, etc., has acquired for expansion former local silk mill of Schwarzenbach-Huber Co.

New England Fuel & Transportation Co., 250 Stuart Street, Boston, has awarded general contract to Rust Engineering Co., Koppers Building, Pittsburgh, for a one-story addition to plant at West Quincy, Mass., primarily for coke storage and distribution, to cost $50,000 with equipment. Plans have also been filed for a new scale house.

Wallace Barnes Co., Bristol, Conn., is developing a capacity schedule at local spring manufacturing works, with day and night forces. Large contract has been secured for springs for new American Austin automobiles.

The Crane Market

INQUIRY for overhead traveling cranes is improving and there is a moderate volume of buying. A list of hand power cranes, consisting of nine 1½-ton, nine 5-ton and nine 10-ton has been awarded by the Austin Co., Cleveland, for the Ajax Pipe Line, Tulsa, Okla. The Brooklyn & Queens Transit Co., Brooklyn, has placed two 10-ton electric cranes with the Box Crane & Hoist Corporation. The Vacuum Oil Co., New York, is in the market for two 2½-ton, 21-ft. span, hand power cranes for Paulsboro, N. J.

In the locomotive crane field the Chesapeake & Ohio Railroad, has closed on a 30-ton pile driver crane with the Browning Crane Co. Inquiry for locomotive cranes continues fair, but buying is rather limited.

Philadelphia

PHILADELPHIA, Aug. 4.—Container Corporation of America, Inc., Nixon and Fountain Streets, Philadelphia, manufacturer of corrugated paper boxes and containers, etc., has awarded general contract to Hughes-Foulkrod Co., Schaff Building, for one-story addition to cost about $25,000. Main offices are at 111 West Washington Street, Chicago.

Clarifying Equipment Corporation, Darby, Pa., care of H. L. Kirk, 102 Felton Avenue, Sharon Hill, Pa., treasurer, recently organized by Mr. Kirk and associates, plans operation of local plant for manufacture of filtering apparatus, clarifying devices and kindred equipment. Jesse W. Roberts, 106 East Woodland Avenue, Sharon Hill, will be an official of new company.

Department of Public Works, Bureau of Wafer, City Hall Annex, Philadelphia, Alexander Murdoch, director, is asking bids until Aug. 13 for two 1800-hp. motors, motor-driven pumping machinery and other equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, is asking bids until Aug. 12 for five pneumatic grinders for Philadelphia Navy Yard.

Ryan, Scully & Co., Wissahickon Avenue and Yelland Street, Philadelphia, manufacturers of furnaces, forges, controllers, etc., have leased a one and two-story factory, 50 x 240 ft., to be erected at 3335 Stockley Street, for new plant, to cost over $65,000 with equipment. Eugene A. Stopper, 10 South Eighteenth Street, is architect.

York Airport, Co., York, Pa., has awarded contract to Blaw-Knox Co., Farmers Bank Building, Pittsburgh, for a hangar at East York airport, with one-story machine and repair shop adjoining, to cost about $35,000 with equipment.

H. Nelson Albright, Columbia, Pa., and associates have organized Utilatree Products Co., with capital of $25,000, to establish foundry for production of plain and machined castings, metal novelties, etc. L. R. Zifferer will be an official of company.

Keystone Corporation, Riverside, N. J., has been organized with a capital of $1,500,000 to take over and expand local plant and business of Keystone Watch Case Co.

Kogod-Dubb Store Fixture Co., Inc., Philadelphia, has leased two-story building at 666 North Broad Street, totaling 21,000 sq. ft. floor space, for new plant for manufacture of store fixtures and equipment.

Hope Machine Co., 2360 North Second Street, Philadelphia, has taken out a permit for a new one-story machine shop.

Selas Co., Philadelphia, manufacturer of industrial gas heating equipment, has begun installation of machinery in a recently purchased plant at Eighteenth Street and Indiana Avenue. Company is carrying out expansion program and new building will house office and plant.

South Atlantic

BALTIMORE, Aug. 4.—Hinde & Dauch Paper Co., Sandusky, Ohio, manufacturer of corrugated paper containers, has begun erection of new plant at Baltimore, 180 x 620 ft., and two-story office, to cost about $350,000 with equipment. Otto Randolph, Inc., 53 West Jackson Boulevard, Chicago, is architect and engineer. Local offices of company at Baltimore are at North Haven Street and Fairmount Avenue.

Board of District Commissioners, District Building, Washington, will receive bids until Aug. 22 for pulverizing machinery and conveying equipment for brick-manufacturing plant at penal institute; until Aug. 14 for two 5-ton crawler-type tractors, with hydraulic-controlled bulldozer, and until Aug. 19 for three steel tanks, 1000 to 4000-gal. capacity.

United States Industrial Alcohol Co., Fairfield, Baltimore, is planning to rebuild part of plant destroyed by fire July 28, with loss over $200,000, including equipment. Headquarters are at 60 East Forty-second Street, New York.

Savannah Electric Light & Power Co., Savannah, Ga., will issue bonds for $2,000,000, part of proceds to be used for expansion and improvements.

Stewart & Co., Charles and Lexington Streets, Baltimore, department store, have asked bids on general contract for

a two-story automobile service, repair and garage building, 165 x 200 ft., to cost over $100,000 with equipment. Joseph E. Sperry, Calvert Building, is architect; H. F. Doeleman, Baltimore Trust Building, is engineer.

Bureau of Yards and Docks, Navy Department, Washington, will receive bids, no closing date stated, for a 55,000-gal. steel tank for naval operating base at San Diego.

Chemical & Pigments Co., St. Helena, Baltimore, has plans for two one-story additions, 50 x 115 ft., and 50 x 108 ft., to cost close to $50,000 with equipment.

Eastern Air Transport Co., Candler Field, Atlanta, Ga., has asked bids on general contract for extensions and improvements in mechanical shop and service buildings at airport, to cost about $30,000 with equipment.

Contract has been let to Merchant Construction Co., 290 Baltimore Court, Asheville, N. C., for three-story and basement building, 25 x 90 ft., to be occupied under lease by Crane Co., Chicago, for factory branch and distributing plant, including pipe department, etc., to cost about $50,000 with equipment. Henry I. Gaines, Public Service Building, Asheville, is architect.

Standard Oil Co., 764 Marietta Street, N. W., Atlanta, Ga., has let general contract to Flagler Co., Red Rock Building, for one-story storage and distributing plant, with garage and service building, 65 x 130 ft., and machine and forge shop, 60 x 100 ft., to cost about $115,000 with equipment.

Pittsburgh

PITTSBURGH, Aug. 4.—With July generally a dull month with machinery dealers in this district, August is beginning with no apparent change in activity. Little new inquiry is coming out and dealers are concentrating their attention on the larger improvement and betterment programs under way in this territory. Tools on such projects are slow in closing, but hold promise of considerable business in the future.

Westinghouse Electric & Mfg. Co. is buying a few tools from month to month, but has discontinued its policy of issuing quarterly inquiries.

In connection with new refinery on Neville Island, Gulf Oil Corporation, Frick Annex, Pittsburgh, has taken out a permit for a one-story machine shop, 45 x 125 ft., to cost about $50,000 with equipment.

Westinghouse Electric & Mfg. Co., East Pittsburgh, has arranged with New Haven Clock Co., New Haven, Conn., for production of new electric clocks under name of New Haven-Westinghouse, including a popular-priced alarm clock, and will provide production facilities at New Haven plant.

Robert C. McElroy, Erie Pa., and associates have organized United States Metal Products Co., to operate a local plant for manufacture of copper, brass, aluminum and other metal products. Lewis A. and Edward B. McElroy, Erie, will be officials of new company, of which Robert C. McElroy will be treasurer.

Naomi Coal Co., Fayette Gity, Pa., is considering rebuilding part of tipple at plant near Fayette City, recently destroyed by fire, with loss of about $50,000 including equipment.

American Austin Motor Car Co., Butler, Pa., which recently established local plant for production of popular-priced automobiles, contemplates expansion for new division for manufacture of automobile bodies, to cost about $500,000 with equipment. C. W. Brandt, Francis Palms Building, Detroit, is company engineer.

Weirton Steel Co., Weirton, W. Va., plans rebuilding part of boiler plant at Clarksburg, W. Va., destroyed by fire July 29.

Buffalo

BUFFALO, Aug. 4.—Bids have been asked on general contract by Ford Motor Co., Dearborn, Mich., for new assembling plant on Hamburg Turnpike, Buffalo, to cost $1,700,000 with machinery. It is understood that part of new works will be equipped as a reclamation plant. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

Shell Eastern Petroleum Products, Inc., 122 East Forty-second Street, New York, an interest of Shell Union Oil Corporation, 65 Broadway, has acquired property at Geneva, N. Y., for a new storage and distributing plant on which work will soon begin, to cost over $125,000 with equipment.

Heater Appliance Corporation, Buffalo, care of Earl G. Harris, 175 North Street, recently formed by Mr. Harris and associates with capital of $200,000, is planning operation of local plant for manufacture of heating equipment and appliances. Marion G. Burleigh, 272 Hyman Boulevard, is also interested in new company.

Savage Arms Corporation, Utica, N. Y., has arranged for purchase of plant and business of Davis-Warner Arms Co., Norwich, Conn., manufacturer of shot guns, etc. Purchasing company is considering removal of Davis-Warner plant to factory of its subsidiary, J. Stevens Arms Co., Chicopee Falls, Mass., carrying out similar production of about 20,000 shot guns a year.

Elk Street Market Corporation, 228-62 Perry Street, Buffalo, plans installation of cold storage and refrigerating machinery, conveying and other handling equipment in new public market at location noted, to cost $600,000.

Central New York Face Brick Co., Kirkville, N. Y., is considering rebuilding portion of plant destroyed by fire July 30, with loss reported at close to $100,000, including presses, conveyors and other machinery.

James Mfg. Co., Elmira, N. Y., manufacturer of farm and barn equipment and implements, has leased property at Weston, Toronto, Ont., for a new branch plant, to be operated by Jamesway, Ltd., a Canadian subsidiary. Equipment will be installed at once.

Detroit

DETROIT, Aug. 4.—Ford Motor Co., Dearborn, has awarded general contract to Clinton Construction Co., 923 Folsom Street, San Francisco, for new assembling plant at Richmond, Cal., with power house, pumping plant and other units, to cost about $3,000,000 with machinery.

Michigan Gear & Engineering Co., 19 West Woodbridge Street, Detroit, has taken out a permit for a new one-story machine shop, to cost about $30,000 with equipment.

William B. Mayor, chief engineer, Ford Motor Co., Dearborn; George M. Holley, head of Holley Carburetor Co., Detroit, and other local interests, have secured a substantial control in Coast Range Steel Co., Ltd., Vancouver, B. C., now being reorganized. Mr. Mayor is scheduled to be president, and will be active in new mill project of Coast Range company on Texada Island, near Vancouver, to cost over $6,000,000.

Bohn Aluminum & Brass Corporation, 2512 East Grand Boulevard, Detroit, has plans for a one-story addition, 50 x 300 ft., to cost over $100,000 with machinery. Christian W. Brandt, Francis Palms Building, is architect and engineer.

Upjohn Co., Kalamazoo, Mich., manufacturer of industrial chemicals, etc., has plans for new factory branch and distributing plant at Memphis, Tenn., to cost over $65,000 with equipment. Hankers & Cairns, Memphis, are architects.

Rolls Racer Corporation, Grand Rapids, has leased a local factory for a new plant for manufacture of children's vehicles, including parts production and assembling.

Commonwealth Heat Treating Co., 5922 Commonwealth Avenue, Detroit, has changed its name to Commonwealth Industries, Inc.

Calumet & Hecla Consolidated Copper Co., Lake Linden, Mich., will start erection at once on a new power plant at Ahmeek, Mich., to cost over $85,000 with equipment. Stone & Webster Engineering Corporation, 38 South Clark Street, Chicago, is engineer, in charge.

Board of Education, Benton Harbor, is considering installation of manual training equipment in new junior high school to cost about $200,000, for which general contract has been let to M. W. Stock Construction Co., Benton Harbor. Warren S. Holmes, Lansing, is architect.

Dumore Tap & Tool Co., Inc., 635 Mount Elliott Avenue, Detroit, manufacturer of taps, reamers, dies, etc., has changed its name to Detroit Tap & Tool Co.

Cleveland

CLEVELAND, Aug. 4.—Republic Brass Co., 1623 East Twenty-fifth Street, Cleveland, manufacturer of plumbers' brass goods, has awarded general contract to A. A. Lane Construction Co., 1873 East Fifty-fifth Street, for one and two-story addition, 25 x 135 ft., to cost about $50,000 with equipment. Company also operates Michigan Copper & Brass Co., Detroit, and Rome Brass & Copper Co., Rome, N. Y.

Standard Slag Co., Youngstown, has plans for a new slag-crushing plant at Warren, Ohio, to be operated in conjunction with local blast furnace of Trumbull-Cliffs Furnace Co., to cost over $80,000 with machinery.

Ohio Rubber Co., Willoughby, Ohio, manufacturer of mechanical rubber products, has awarded general contract to H. K. Ferguson Co., Cleveland, for one-story addition, 120 x 480 ft., to cost close to $500,000 with machinery.

Ohio Edison Co., Akron, Ohio, has arranged for a bond issue of $18,834,500, part of proceeds to be used for extensions and improvements in power plants and system, including transmission lines.

Sulphio Co., Martins Ferry, Ohio, manufacturer of copperas from acid from steel mill pickling vats, is planning to rebuild coal-pulverizing and furnace plant recently destroyed by fire, with loss of about $75,000 including equipment.

Chicago

CHICAGO, Aug. 4.—Machine tool sales in July were spotty and fresh inquiries were not of sufficient moment to point to betterment in the new month. With the exception of five large lathes, a planer and a motor-driven grinder which will be purchased by the Illinois Steel Co., industrial lists are absent.

The Chicago, Burlington & Quincy, which last week asked for prices on four large machines, is opening bids this week and the trade looks for quick action on these items. Chicago, South Shore & South Bend is in the market for a 30-in. lathe. The Milwaukee Road is still holding in check orders which were issued over a month ago for car shop equipment. Action on a list for the Austin High School, Chicago, has been postponed a week. The Western Electric Co. has resumed operations after having been closed two weeks.

Tri-City Pattern & Engineering Co., is new name adopted by purchasers of G. G. Forester Mfg. Co., Moline, Ill., manufacturer of wood and metal patterns.

Pickands, Mather & Co., Cleveland, have awarded contract to John Rautio, Ely, Minn., for a new power house at Zenith Iron Mines. Company will also install a crushing plant at Sunday Lake Iron Mine.

Chicago Great Western Railroad will build a round house, 80 x 90 ft., at Harrison and Wells Streets, Chicago. Blauner Construction Co., 189 West Madison Street, is general contractor.

Car Service Corporation, 2241 South Wabash Avenue, Chicago, has awarded general contract to Henry Ericsson Co., 228 North La Salle Street, for a four-story and basement automobile service, repair and garage building, to cost about $250,000 with equipment. Holabird & Root, 333 North Michigan Avenue, are architects.

Orenda Corporation, Wilmington, Ill., is planning to rebuild part of local paper mill recently destroyed by fire. Headquarters are West Forty-fourth Street and South Oakley Avenue, Chicago.

Cyclone Fence Co., Dekalb, Ill., manufacturer of wire-fencing, etc., has work under way on an improvement program, to cost over $250,000, for which general contract recently was let to Guldbeck & Eckstrom, DeKalb. Additional equipment will be installed.

Standard Oil Co. of Indiana, Equitable Building, Des Moines, Iowa, has filed plans for a one-story machine shop, 68 x 105 ft., at storage and distributing plant, to cost about $35,000 with equipment. General contract has been let to Wickes Engineering Co., Bluff Street.

Board of County Commissioners, County Highway Department, Pueblo, Colo., has plans for a one-story and basement mechanical shop, to cost about $40,000 with equipment. Walter DeMordaunt, First National Bank Building, is architect.

Northwest Paper Co., Cloquet, Minn., has work under way on one-story addition, 125 x 724 ft., to be used as a machine department, beater and finishing division, to cost over $500,000 with equipment. General contract recently was let to James Leck Co., 211 South Eleventh Street, Minneapolis. Jacobson Engineering Co., Plymouth Building, Minneapolis, is architect and engineer.

Board of Education, Algona, Iowa, is considering installation of manual training equipment in new two-story and basement high school, to cost about $225,000, for which general contract has been let to J. H. Mayer Construction Co., Humboldt, Iowa. Proudfoot, Rawson, Souers & Thomas, Hubbell Building, Des Moines, Iowa, are architects.

City Council, Shelby, Mont., is considering installation of a municipal electric light and power plant, with Diesel engine unit, to cost over $80,000 with equipment.

Mid-Western Aircraft Co., Elgin, Ill., plans rebuilding of hangar at airport, recently destroyed by fire, including shop and repair facilities.

Milwaukee

MILWAUKEE, Aug. 4.—The machine tool business in general is dull and lifeless. A few builders are maintaining production schedules close to capacity on old orders and the new business that is trickling in, but this is not the rule. Inquiries from the automotive industries have been somewhat more numerous, but it is believed that business from this source will depend largely upon the degree of public acceptance of new models within the next sixty days. Replacement orders are still the mainstay of the market.

Moise Steel Co., 447 Virginia Street, Milwaukee, jobber of sheet steel, has placed contracts for a new plant and warehouse, 77 x 247 ft., part two stories, in West Milwaukee, to cost about $65,000.

Milwaukee Gear Co., 1224 Third Street, Milwaukee, contemplates erection of new plant and office building, 200 x 100 x 200 ft., ell-shaped, part two stories, but work may be delayed until next spring. Estimates are being taken on private plans. Emil G. Borisch is president and general manager.

M. Tullgren & Sons Co., architect, 20 Prospect Avenue, Milwaukee, will take bids after Aug. 15 for new branch house for Crane Co., Chicago, with Milwaukee office at 100 Second Street. Main building will be 75 x 200 ft., two stories; pipe shed, 60 x 100 ft., and garage, 36 x 40 ft. Investment of $150,000 is planned. E. M. Faul is manager of Milwaukee branch.

C. H. Brugger and Charles F. Larzelere, Fond du Lac, Wis., have organized B. & L. Co., to manufacture line of sporting goods made from corrosion-resistant steel, to include ring tips for fishing rods, folding landing nets, etc. Space has been leased in plant of Longdin & Brugger Co., 135-145 South Macy Street, manufacturer of automobile tops.

Kimberly-Clark Co., 128 North Commercial Street, Neenah, Wis., is taking bids through its engineering department for improvements to Lakeview paper mills, including two-story mill addition, 60 x 150 ft., and machine shop extension, 50 x 75 ft, to cost about $50,000.

Common Council of Rhinelander, Wis., has authorized construction of filtration plant extension of municipal waterworks system costing about $75,000 and is considering tenders from consulting engineers to handle project. It is planned to begin work this year. T. M. Wardwell is city manager.

Ahdawagam Paper Products Co., Wisconsin Rapids, Wis., has plans for a one-story addition, 111 x 200 ft., to its local mill, to cost $75,000 including equipment.

Cedar Creek Hydraulic Co., Cedarburg, Wis., has plans for new power dam and hydroelectric generating plant on Cedar Creek, with initial investment of about $50,000.

Milwaukee County Board of Supervisors has authorized construction of hangar No. 3 at County Airport, Cudahy, and instructed John Messmer, county superintendent of construction, to prepare plans. Building will be 100 ft. sq. and 22 ft. high, and cost about $50,000.

Indiana

INDIANAPOLIS, Aug. 4.—Standard Casket Hardware Co., Greensburg, has awarded general contract to William A. Gutzwiller, Batesville, for one-story plant unit, 50 x 140 ft., to cost about $35,000 with equipment.

Combustion Vitalizer Corporation, Indianapolis, recently organized, has established a temporary plant at 1019 East Fifteenth Street, for manufacture of patented fuel equipment for increased boiler efficiency and eliminating smoke. Company plans to locate in another building soon, and increase output. Sherman H. Tompkins, head of the United Building Supply Co., Indianapolis, is president of new organization.

Board of Education, Gary, has rejected bids recently received for a new three-story and basement high school, to include a manual training department, and will ask new bids soon on general contract. William B. Ittner, Inc., Continental Life Building, St. Louis, is architect.

American Can Co., 230 Park Avenue, New York, has begun clearing site for new plant at Terre Haute, to be three stories and basement, 180 x 350 ft., with smaller units, to cost about $1,000,000 with equipment. Bids have been asked on general contract. Company engineering department, address noted, is in charge.

Cincinnati

CINCINNATI, Aug. 4.—Except for a slight increase in inquiry for single items, the machine tool situation is about on a level with that of a week ago. Orders continue to drag and are just sufficient in volume to maintain operations at the present rate of about 40 per cent of normal. District manufacturers, however, are of the opinion that a pick-up in demand will come in the early fall.

Sorg Paper Co., Middletown, Ohio, has awarded general contract to Martin L. Bauer, Middletown, for a one-story addition, to cost about $50,000 with equipment.

Mid-West Machine Co., 26 Canal Street, Dayton, Ohio, has filed plans for a one-story addition.

Contracting Officer, Wright Field, Dayton, Ohio, will receive bids until Aug. 13 for two tool room lathes, until Aug. 11 for two motor-generator sets, and until Aug. 19 for 70 or 220 ring mount assemblies.

Gulf Refining Co., Frick Annex, Pittsburgh, is planning construction of oil storage and distributing plant at Memphis, Tenn., for barge and motor truck service, to cost over $500,000 with equipment. It will include a pumping plant, machine shop and other mechanical units.

Cities Service Co., Kansas City, Mo., operating oil and gas properties, has acquired plant and properties of West Ken-

tucky Oil Co., Mayfield, Ky., and will consolidate. Purchasing company plans expansion, including additional storage and distributing facilities.

Board of Education, Buena Vista, Tenn., is considering installation of manual training equipment in new junior high school to cost about $160,000, for which plans will be prepared by Marr & Holman, Stahlman Building, Nashville, Tenn., architects.

Plant and business of Fairyland Co., Twenty-eighth Street and Belt Line Railroad, Chattanooga, Tenn., have been acquired by new interests, headed by W. H. Patterson, 6019 Grafton Avenue, Pittsburgh, which will operate in future. Company specializes in production of patented equipment for Tom Thumb golf courses, and new owners plan expansion, with installation of additional machinery.

St. Louis

ST. LOUIS, Aug. 4.—City Council, Independence, Mo., plans early call for bids for extensions and improvements in municipal electric light and power plant, including two 500-hp. boilers, stokers, coal, ash-handling and machine shop equipment, etc., to cost $113,500. Later, council proposes installation of a new steam-operated turbine unit. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers.

Missouri State Highway Department, West Main and Harrison Streets, Jefferson City, Mo., has received a low bid on general contract from McCarthy Brothers Construction Co., Delmar and Euclid Avenues, St. Louis, for two- and three-story automobile service, repair and garage building, 125 x 216 ft., for State-owned cars and motor trucks, to cost about $150,000 with equipment. A. T. Campbell is engineer in charge.

Central Power Co., Grand Island, Neb., has arranged for a bond issue of $1,000,000, part of proceeds to be used for extensions and improvements.

Lincoln Telephone & Telegraph Co., 1342 M Street, Lincoln, Neb., has asked bids on general contract for a two-story addition to equipment storage and distributing plant, 50 x 150 ft., to cost over $60,000 with equipment. Davis & Wilson, 525 South Thirteenth Street, are architects.

Crossett Chemical Co., Crossett, Ark., recently organized by W. H. Matthews, president, Forest Products Chemical Co., Memphis, Tenn., will soon begin construction of new plant for production of acetic acids and other chemical products from hardwood distillation, to cost over $80,000 with machinery. Company has also secured about 400,000 acres of timber lands in neighboring counties and will provide facilities for raw material supply, including logging, conveying and other equipment.

Board of Public Utilities, Charles A. Lowder, secretary, Kansas City, Kan., is planning early call for bids for extensions and improvements in municipal electric light and power plant, including power apparatus, coal and ash-handling equipment, etc. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

City Council, Hayti, Mo., is planning construction of a municipal electric light and power plant to cost about $75,000 with equipment. Rusell & Axon, 6200 Easton Avenue, St. Louis, are consulting engineers.

Southwest Wire & Iron Works, 1720-30 Tracy Avenue, Kansas City, Mo., is planning to rebuild part of plant destroyed by fire July 26, with loss estimated at $40,000 including equipment.

Ryan Aircraft Corporation, whose plant at Lambert-St. Louis Field, near St. Louis, has been operated on a reduced schedule since last fall, has been closed. A service manager and several mechanics have been retained to make repairs on Ryan planes now in use.

Liberty Foundry Co., St. Louis, suffered a $5,000 fire loss July 23, which damaged elevators to charging floor. Damage will be repaired by its maintenance department and no additional building material or equipment will be required. Plant operations were not interrupted.

Gulf States

BIRMINGHAM, Aug. 4.—City Council, Birmingham, has plans for a hangar with shop and repair facilities at municipal airport, and new administration building, to cost over $60,000 with equipment. It is expected to ask bids on general contract in fall. E. W. Stanford, Martin Building, is associate architect; A. J. Hawkins, is city engineer.

Big Lake Oil Co., Big Lake, Tex., is planning early construction of a new gasoline refinery near Texon, Tex., with air compressors, etc., to handle output of 50 000,000 cu. ft. of gas a day, to cost over $200,000 with machinery.

Federal Supply Co., Mexia, Tex., is planning to rebuild part of machine shop recently destroyed by fire.

Board of Education, San Antonio, Tex., has plans for remodeling and improving three buildings of present high school group for a vocational training school, one unit to be equipped for machine, mechanical and electrical building, to cost over $100,000 with equipment. Harvey P. Smith, National Bank of Commerce Building, is architect.

Dallas Power & Light Co., Dallas, Tex., has secured permission to expend $1,258,247 over next 24 months for extensions and improvements in power plants and system in city limits, including transmission lines.

Superior Earth Co., Emathla, near Ocala, Fla., operating Fuller's earth properties has plans for a new mining and refining plant to cost over $70,000 with machinery, to replace an existing works. C. C. Rupprecht is technical manager, in charge.

Hughes Tool Co., Hughes Street, Houston, Tex., manufacturer of oil-well drilling tools and equipment, has awarded general contract to Southwestern Construction Co., West Building, for two-story and basement addition, 150 x 300 ft., to be used in part for storage and distribution, to cost over $150,000 with equipment. Company also has plans for a new one-story mechanical shop in two sections, 160 x 420 ft., and 20 x 220 ft., and a one-story pattern shop, to cost over $200,000 including equipment. R. C. Kuldell is general manager.

Great Atlantic & Pacific Tea Co., 420 Lexington Avenue, New York, has leased four-story building, 105 x 333 ft., to be erected at Dallas, Tex., for which general contract has recently been let to Ferro Concrete Construction Co., 203 West Third Street, Cincinnati. Elevating, conveying, and other mechanical-handling equipment will be installed, entire project to cost about $300,000.

J. W. Woolwine, president, Chamber of Commerce, Yazoo City, Miss., and associates are at head of project to establish a municipal airport on property now being selected. Project will include hangar, repair shop, oil storage and other field units, to cost over $50,000 with equipment.

Florence Citrus Growers' Association, Florence Villa, Fla., has work under way on new local canning plant, to include installation of conveying, loading, packing, can-sealing and other equipment, to cost about $150,000.

Pacific Coast

SAN FRANCISCO, July 31.—Municipal Lighting Department, Pasadena, Cal., has engaged Bennett & Haskell, First Trust Building, architects, to prepare plans for an addition to electric light and power plant, to cost about $150,000 exclusive of equipment, latter estimated to cost close to $900,000.

General Petroleum Corporation, 310 Sansome Street, San Francisco, is considering plans for a new oil refinery at Torrance, Cal., where 1000 acres was acquired several months ago, plant to include power house, machine shop and other structures, to cost over $7,500,000 with machinery.

Consolidated Steel Corporation, Los Angeles, has purchased 50 acres at Eastern and Slauson Avenues and taken options on 20 acres additional, site to be used for a new plant, primarily for structural steel fabricating division. It is proposed to remove plant of Union Iron Works, an affiliated interest, to new location and increase capacity.

Craft Films, Inc., Los Angeles, care of H. A. McMurphy, 6347 Eleanor Avenue, architect, has plans for a new laboratory for talking picture production, with main unit, 135 x 150 ft., to cost over $500,000 with equipment.

Newport Harbor Union High School District, Newport Beach, Cal., has plans for a vocational shop at high school at Costa Mesa, to cost about $40,000 with equipment. Marsh, Smith & Powell, Architects' Building, Los Angeles, are architects.

Johns-Manville, Inc., Madison Avenue and Forty-first Street, New York, manufacturer of insulation products, roofing, etc., has leased one-story building, 50 x 209 ft., to be erected at Seattle, for new factory branch and distributing plant, to cost about $45,000 with equipment. Local offices of company are in Henry Building.

Agricultural Potassium-Phosphate Co., Los Angeles, recently organized with capital of $1,000,000 has purchased former plant of American Potash & Chemical Co. at Los Angeles Harbor for a new plant for manufacture of commercial fertilizers and kindred products. Headquarters will be established at once. Company has also acquired phosphate properties near Paris, Idaho, for raw material supply, and will install rock crushing plant, conveying, loading and other equipment.

Wood & Iverson Lumber Co., Hobart, Wash., is considering rebuilding portion of mill, including blacksmith and forge shop, and other mechanical departments, recently destroyed by fire.

Southern Sierras Power Co., Riverside, Cal., is planning expansion near Blythe, Cal., including steel tower transmission line from that place to Calipatria, power substation and switching facilities, etc., to cost $370,000, work to begin next month.

Foreign

WORK is under way by Continental Can Co., 1 Pershing Square, New York, on new can-manufacturing plant near Havana, Cuba, to be ready for machinery installation in October, to cost over $200,000.

Saxon Public Works, Inc. (Aktiengesellschaft Sachsische Werke), Halle, Germany, operating electric light and power properties in State of Saxony, is disposing of a note issue of $10,000,000, part of fund to be used for expansion and betterments.

Ford Motor Co., Dearborn, Mich., is concluding purchase of large tract on Calzada de Guadalupe River, near Mexico City, Mexico, as site for a new assembling plant, to cost over $750,000 with machinery.

Municipal Council, Rio de Janeiro, Brazil, is planning early construction of municipal airport at Morro do Castello, where large tract has been selected, to include hangars, repair and reconditioning shops, oil storage and other field units, to cost over $400,000 with equipment. New airport will be used by Condor Syndicate, Pan-American Airways and French Aeropostal lines.

Empresas Electricas Mexicanas, Ltd., operating electric light and power properties in Mexico, an interest of American & Foreign Power Co., 2 Rector Street, New York, has arranged for increase in capital from a nominal amount of 10,000 shares to 3,000,000 shares of stock, no par value, part of fund to be used for expansion. Company is considering acquisition of Compania Nacional de Electricidades, S. A., Torreon, Mexico, and will extend generating and transmission facilities.

Procter & Gamble Co., Gwynne Building, Cincinnati, manufacturer of soaps, oils, acids, etc., has purchased controlling interest in Thomas Hedleyce, Ltd., London, England, manufacturer of similar products, with plants at Newcastle-on-Tyne, Birmingham and Wathondearne. Purchasing company will operate as a British subsidiary and will continue Hedleyce plants for present line of output with additional capacity for manufacture of own products. Company is considering purchase of other foreign plants in France and Germany for manufacture of its specialties.

New Trade Publications

Hand Trucks.—American Pulley Co., 4200 Wissahickon Avenue, Philadelphia. Pocket-size, illustrated booklet of 36 pages, devoted to standard line of pressed steel hand trucks, and introducing seven new styles.

Power Transmission Belt.—Worthington Pump & Machinery Corporation, Harrison, N. J. Bulletin L-400 of eight pages, describing and illustrating application of Multi-V-Drive belt for power transmission. It combines a new long-life type of rubberized cord V-belt, impervious to dust and moisture, with an improved V-grooved sheave.

Railroad Shop Equipment.—Whiting Corporation, Harvey, Ill. Catalog "Modern Methods in Repair Shops," of 120 pages, attractively illustrated with installation photographs of handling equipment for caring for locomotives and various other types of railroad equipment. Cranes and other forms of hoists are featured.

Automatic Control Equipment.—Ryan, Scully & Co., 3711 Wissahickon Avenue, Philadelphia. 16-page catalog on equipment for the automatic control of air, oil, gas, or any liquid, in connection with temperature and combustion control. Illustrations are given.

Fin-Tube Economizer.—Combustion Engineering Corporation, 200 Madison Avenue, New York. Catalog of 12 pages describing the C-E fin-tube economizer for industrial use. Among the features claimed for this new development are: arrangement of the finned U-tubes, making installation possible in less than half the space required for a straight, plain-tube economizer; fewer return bend joints, and high rate of heat transfer.

Roller Bearing Blowers.—The P. H. & F. M. Roots Co., division of The Stacey Engineering Co., Connersville, Ind. Two new four-page illustrated bulletins on low pressure and high pressure roller bearing blowers. Bulletin No. 22-B2 covers the low pressure blower, and bulletin No. 23-B2 covers the high pressure units.

Bronze Alloy.—Bridgeport Brass Co., Bridgeport, Conn. A 10-page booklet describes the company's silicon bronze alloy "Duronze," giving its physical properties, resistance to acid, forming and drawing qualities and the forms in which it is furnished as sheet, strip, rod or wire. The "Duronze" rod, which has a tensile strength of 100,000 lb. per sq. in., may be readily upset and roll threaded for cap and machine screws. Starting with strength of about 42,000 lb. per sq. in. as annealed it develops 130,000 lb. per sq. in. when severely cold drawn, and cold drawing does not make it brittle.

Corrosion-Resistant Pipe.—Republic Iron & Steel Co., Youngstown, Ohio. A 32-page booklet on pipe made of "Toncan" metal. Outlines the advantages of this pipe, such as resistance to corrosive agents and physical qualities of high-grade open-hearth steel. It may be handled like any iron, takes a clean, sharp thread easily, welds by usual methods and holds a galvanizing coating equal to the best quality iron or steel, it is asserted. Separate sections in the booklet are devoted to detailed description and illustration of these qualities, photographs of processes in the plant and illustrations of the uses to which "Toncan" pipe has been applied.

Chrome Cement.—E. J. Lavino & Co., Bullitt Building, Philadelphia. A booklet on "Kromepatch," a dry chrome ore cement for bonding refractory brick annealing furnaces, open-hearth, electric or blast furnaces, cupolas, kilns, coke ovens and other furnaces. When mixed with water it remains in suspension, permitting application by any convenient method. It air-sets after mixing with water slowly enough to permit reclaiming hours after exposure, provides strength at all temperatures, bonds with brick without fluxing the adjacent surfaces and has a hot load capacity higher than ordinary brick, it is stated.

Production Control.—McCaskey Register Co., Alliance, Ohio. Folder quoting letters from three manufacturers using the company's stock-keeping and production systems.

Metal Products.—L. F. Grammes & Sons, Inc., Allentown, Pa. A 96-page catalog illustrating the company's complete line of products, etched, punched, plated, hard enameled and lithographed. It includes metal signs and display stands, name plates, dials, panels, coins and tokens, ornamental corners and catches, escutcheon pins and small nails, and specialties for the stationery trade. A number of photographs of operations in the company's shops are included.

Aircraft Tubing.—Summerill Tubing Co., Bridgeport, Pa. The company's 1930 catalog in 24 pages gives complete specifications on straight carbon and chrome-molybdenum tubing for aircraft and is illustrated with photographs of the processes through which the tubing passes in manufacture.

Elevators. — Warner Elevator Mfg. Co., Cincinnati. Four-page bulletin describing the use of freight elevators in a building conducting pickling operations. Smooth automatic leveling of the elevators prevents splashing and spilling the vinegars, which have a destructive effect on walls and floors.

Motors.—Reliance Electric & Engineering Co., Cleveland. A bulletin advocating color on motors as an aid to maintaining cleanliness. Reliance motors are now being furnished with direct-current windings coated with a bright orange enamel, on which dirt may be detected immediately. The enamel is tough and adherent and provides more than usual resistance to water, oil and acid.

Vacations.—Metropolitan Life Insurance Co., New York. A 16-page booklet, entitled "Vacations for Industrial Workers," gives a survey of 20 companies which have adopted vacations for the workers in their plants. Sections are devoted to eligibility of the worker, company camps, payment for vacations and savings plans. The plans of five selected companies are given comparatively in the form of a table.

Die Blocks.—Heppenstall Co., Pittsburgh. Bulletin of 52 pages, illustrated, devoted to various grades of die blocks, piston rods, hammer rams, etc. Tables of weights and measurements are given, and much engineering information.

Conveyors.—Bailey-Burruss Mfg. Co., Atlanta, Ga. Two circulars, illustrating and describing Perfecto superhelicoid, cold rolled, cold formed, continuous-flight spiral steel conveyor, the advantages of which are said to be metal density, uniformity in pitch and diameter, wear resistance, low friction, great strength and long life.

Welding Machines.—Micro Products Co., Peoria, Ill. Folder of four pages, describing and illustrating a new heavy-duty micro-weld electric unit, for welding stock of all shapes from ¼ to ⅝-in. sizes.

Automatic Industrial Furnace.—Hyro Mfg. Co., Inc., 200 Varick Street, New York. Eight-page illustrated booklet, dealing with Hyro automatic furnaces for case hardening by cyanide and other salts, heat treating, etc.

Locomotive Cranes. — Industrial Brownhoist Corporation, Cleveland. Booklet 309 of 16 pages, illustrating and describing complete line of gasoline and Diesel powered locomotive cranes, which includes machines ranging from 10 to 40 tons capacity.